Math 8

Fundamentals 1st
LEARNING CENTRE

Complete Workbook

★ Aligned with Alberta curriculum
★ Contains practice questions and answers

2020 EDITION

Table of Contents

Data Analysis and Probability

1. Lisa flips a coin 10 times. She gets heads 7 times and tails 3 times.
   If she flips the coin 30 times, how many times do you expect she will get tails based on her previous results?
   A) 3
   B) 6
   C) 9
   D) 15

2.

   If the two spinners above are each spun, what is the probability of them both landing on red?

   A) $\frac{1}{7}$

   B) $\frac{1}{12}$

   C) $\frac{7}{12}$

   D) $\frac{1}{3}$ or $\frac{1}{4}$ depending on the spinner used

3.

   Some students are planning a bicycle tour. They will start at Mathville, travel to Tesselation Town, on to Binaryburg, and finally, return to Mathville.

   The above map shows the possible routes between the destinations.

   If the students never backtrack, there are _____ ways for the students to make their trip.

4. Passwords for your school's computer accounts are made up of any three lowercase letters. If these letters are chosen completely at random, what is the probability that your password will be "cat"?

A) $\dfrac{3}{17576}$

B) $\dfrac{3}{676}$

C) $\dfrac{1}{17576}$

D) $\dfrac{1}{676}$

5. Alistair is looking for data for his research project which is attempting to see if there is a relationship between the number of buds a sunflower gets and the amount of sunlight it receives daily. Which of the graphs shown below would give Alistair the BEST data for his project?

A)

B)

C)

D)
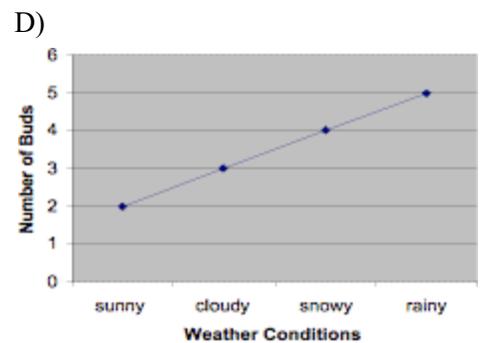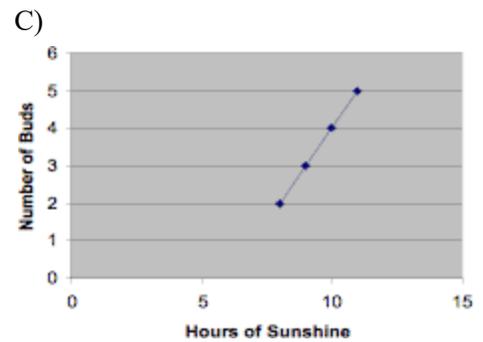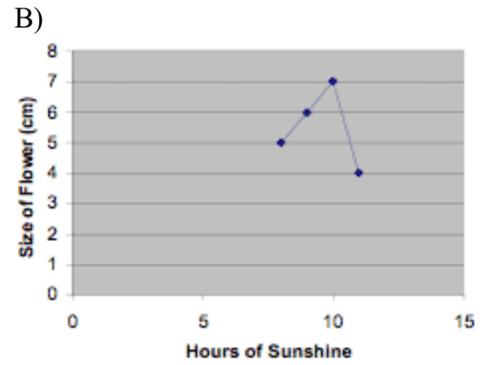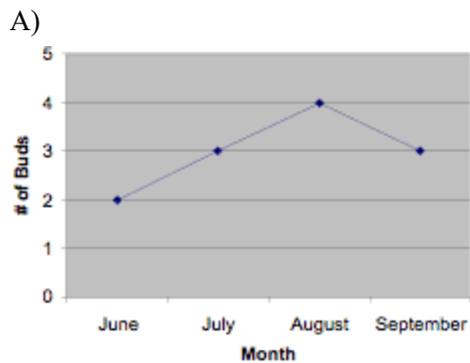
6.

A student has two standard, six-sided dice. One die is blue and the other is red.

The probability of rolling a sum that is greater than ten with the two dice is

A) $\frac{1}{6}$

B) $\frac{1}{8}$

C) $\frac{1}{10}$

D) $\frac{1}{12}$

7.

Clarence and Philip are each holding a bag with all the letters of the name 'AMANDA' (the cute new girl in class) in a bag.

If each of them draws one letter randomly from his own bag, what is the probability that neither Clarence nor

Philip will draw the letter 'A'?

A) $\frac{1}{4}$

B) $\frac{1}{6}$

C) $\frac{1}{36}$

D) $\frac{9}{6}$

8. Ravi is looking at ticket sales for two popular movies for a math project. The local movie theatre has provided him with information about sales per week, for a 6 week period.
If his teacher wants him to create a graph to help him make predictions about future sales, what graph would best enable him to do this?
A) A double bar graph
B) A double line graph
C) Two circle graphs.
D) A pictograph

9.

You bought five raffle tickets for a brand new mountain bike. One thousand tickets were sold in total. You also bought 10 raffle tickets for a dirt bike. Two thousand of those tickets were sold.

What are the chances that you will win both bikes?

A) $\dfrac{1}{40000}$

B) $\dfrac{15}{4000}$

C) $\dfrac{1}{2000}$

D) $\dfrac{50}{4000}$

10.

Tom recorded his spending over the course of one month.

Then, he created a circle graph to display the information he had collected:

Tom's monthly spending ($200)
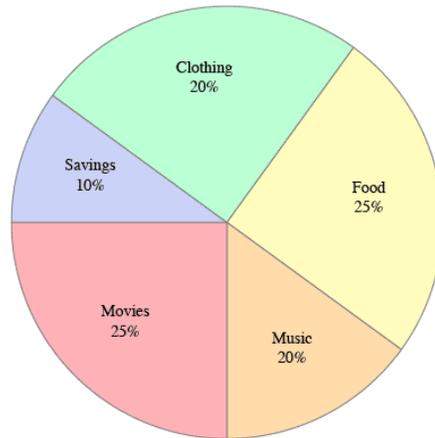
He also decided to display the same information in a pictograph:

Tom's monthly spending ($200)
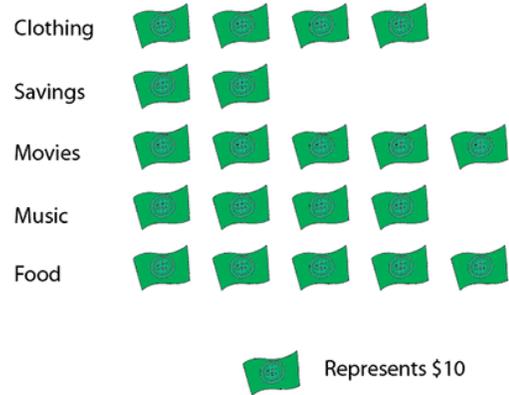
Which graph would **best** enable Tom to determine the two items that made up half of his monthly spending?
A) The circle graph
B) The pictograph
C) Both the circle and the pictograph
D) Neither the circle graph nor the pictograph

11. Matt, the manager of the local grocery store, is disappointed by the shipments of eggs that he received on Monday and Tuesday. Out of every 12 eggs, 9 were in good shape, but 3 were cracked. If Matt randomly selects one egg out of Monday's shipment and 1 egg out of Tuesday's shipment, what is the probability that he will select 2 cracked eggs?

A) $\dfrac{3}{144}$

B) $\dfrac{9}{144}$

C) $\dfrac{6}{144}$

D) $\dfrac{12}{144}$

12.
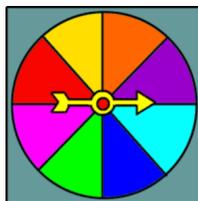
The game of Pictivia uses a spinner to determine how a player will move on the board.

After 3 spins, what is the probability that the spinner landed on the red area for all the spins?

A) $\dfrac{3}{3}$

B) $\dfrac{3}{8}$

C) $\dfrac{1}{27}$

D) $\dfrac{1}{512}$

Sound	Level
Leaves rustling	20 dB
Whisper	30 dB
Traffic noise	75 dB
Gas powered mower	90 dB
Playoff hockey game	100 dB
Thunder clap	115 dB
Loud concert	120 dB
Jet engine close up	150 dB

13.

The table above shows the decibel levels of different sounds. Which type of graph would be the best for displaying this data?

A) A bar graph
B) A line graph
C) A circle graph
D) A pictograph

14. If you flip a penny, a dime and a loonie, the probability of getting ALL HEADS, expressed as a percent, is _____ %
(Report your answer rounded correctly to ONE decimal place.)

6

15. If it is equally likely that a child will be born a boy or a girl, what is the probability that a family with two children have two girls?

    A) $\frac{1}{4}$

    B) $\frac{1}{2}$

    C) 2

    D) 1

16.

Tom recorded his spending over the course of one month.

Then, he created a circle graph to display the information he had collected:

Tom's monthly spending ($200)
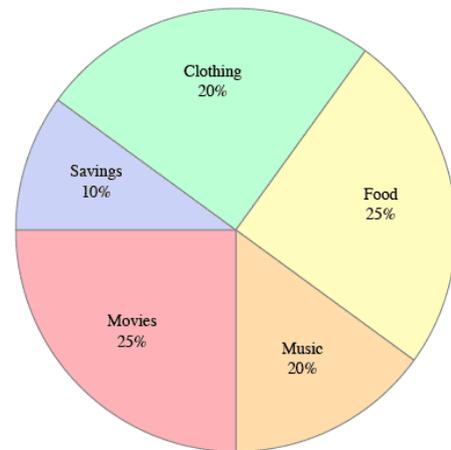
He also decided to display the same information in a pictograph:

Tom's monthly spending ($200)
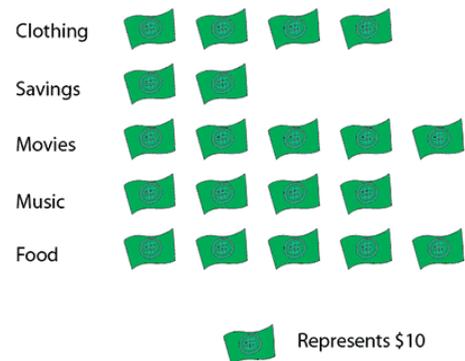
If Tom wanted to know how much more money he spent on food than on savings. Which graphic representation would **best** enable him to answer that question?
A) The circle graph
B) The pictograph
C) Both the circle and the pictograph
D) Neither the circle graph nor the pictograph

17. If a die is thrown 120 times, about how many times should it show a 2?

    A) $\frac{1}{6}$

    B) 20

    C) $\frac{1}{20}$

    D) 2

18. A bag contains 3 red marbles and 3 green marbles. What is the probability of drawing 2 green marbles in succession (one after the other) if the first marble drawn is replaced before the second marble is drawn?

    A) $\frac{1}{6}$

    B) 0.5

    C) 0.25

    D) $\frac{1}{3}$

19. Ernie is conducting a survey to see if there is a relationship between a person's age and their favorite ice cream flavour. Which of the following ways of displaying data would be best for this particular situation?
    A) Stem and leaf plot
    B) Line graph
    C) Pie chart
    D) Bar graph

20. How many 4 digit integers can be created using only the digits 1, 2, 3 and 4?
    (Note that a digit can be repeated, e.g. 4442 is fine.)

A) 512
B) 256
C) 128
D) 64

21. How many 4 digit integers can be created using only the digits 1, 2, 3 and 4?
    (Note that a digit can be repeated, e.g. 4442 is fine.)
    A) 512
    B) 256
    C) 128
    D) 64

22. A Grade 8 Math student was writing a test and found at the end that there were two questions that he didn't have any idea how to answer, not the slightest clue.
    He decided right then and there to better prepare for the next test, but in the meantime, he had no option but to guess!
    If the two questions were both of the multiple choice variety, with FIVE possible choices each, and the student guessed, what is the probability that he would answer both questions CORRECTLY?

    A) $\frac{1}{2}$

    B) $\frac{1}{4}$

    C) $\frac{1}{5}$

    D) $\frac{1}{25}$

23. Suppose you tossed a coin 5000 times. How many times would you predict the coin would land heads up?

A) $\frac{1}{2}$

B) 0.5

C) 50%

D) 2500

24. Passwords for your local library's computer accounts are made up of a letter, a number (single digit), and then a letter, in that specific order. If everything is chosen completely randomly, what is the probability that your password is "i2i"? (The number can be 0-9)

A) $\frac{3}{6760}$

B) $\frac{3}{260}$

C) $\frac{1}{6760}$

D) $\frac{1}{260}$

25. If it is equally likely that a child will be born a boy or a girl, what is the probability that a family with two children have two girls?

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 2

D) 1

26. A coin and a standard 6-sided die are each tossed. What is the probability of getting heads and a multiple of two?

A) $\frac{4}{8}$

B) $\frac{1}{12}$

C) $\frac{1}{4}$

D) $\frac{1}{2}$
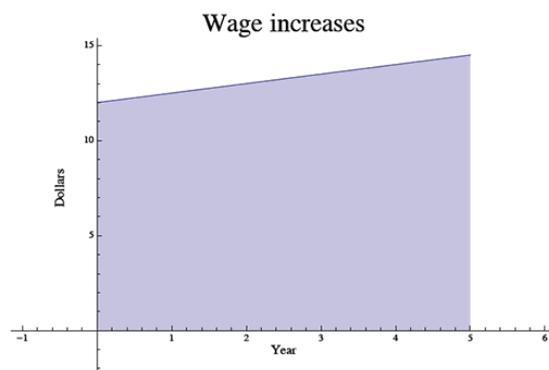
27. What is the problem with the graph shown above?
A) The area under the line is shaded in.
B) The scale does not begin at zero.
C) The scale is not uniform.
D) The graph is not clearly labeled.

9

28. Mr. Ferguson organizes the school ski club. He has a list of 55 students who have paid to go skiing tonight. 25 of the students are in grade 9, 18 are in grade 8, and 12 are in grade 7.
The probability that the first student on the bus to the ski hill will be in grade 9, and the first student on the bus back home will be in grade 7, is

    A) $\frac{37}{55}$

    B) $\frac{2}{55}$

    C) $\frac{1}{37}$

    D) $\frac{300}{3025}$

29. Suppose you rolled two dice 1000 times. How many times would you expect to get a sum of 9?
    A) 100
    B) 111
    C) 9
    D) 99

30. What is the probability of tossing two 6-sided dice and getting a sum of 12?

    A) $\frac{1}{6}$

    B) $\frac{1}{36}$

    C) $\frac{2}{6}$

    D) 0

31.

A student has two standard, six-sided dice. One die is blue and the other is red.
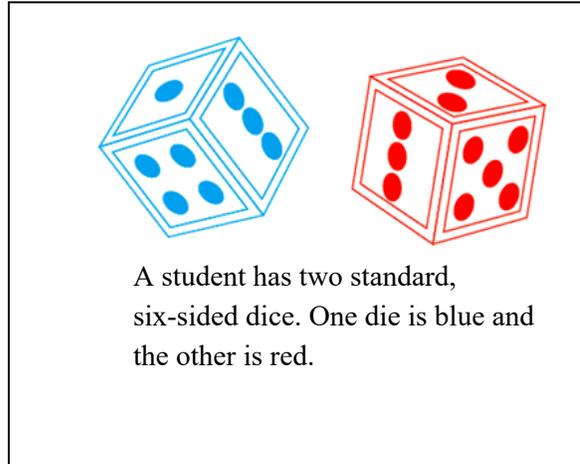
The probability of rolling both dice and getting a number on the blue die that is greater than the number on the red die is

A) $\frac{1}{12}$

B) $\frac{5}{12}$

C) $\frac{7}{12}$

D) $\frac{11}{12}$

32. Lisa flips a coin 10 times. She gets heads 7 times and tails 3 times.
If she flips the coin 30 times, how many times do you expect she will get tails based on her previous results?
    A) 3
    B) 6
    C) 9
    D) 15

33.

The meteorologist from a TV station predicts that the chance of rain today is 40% in Calgary and 30% in Black Diamond.

The probability that it will rain in both cities today is
A) 10%
B) 12%
C) 70%
D) 72%

Wage increases

34.

What is the problem with the graph shown above?
A) The area under the line is shaded in.
B) The scale does not begin at zero.
C) The scale is not uniform.
D) The graph is not clearly labeled.

35. If it is equally likely that a child will be born a boy or a girl, what is the probability that a family with two children have two girls?

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 2

D) 1

36.

Evan is buying a sandwich for his lunch.

The school cafeteria serves four types of sandwiches, peanut butter and jelly, tuna, ham and cheese or egg salad, on three kinds of bread, white, whole wheat or rye.

Coincidentally, when Evan gets to the front of the line and asks for a sandwich, there is only one of each possible sandwich combination left to serve. Evan HATES egg salad and simply can't stand the taste of rye bread.

If the person serving lunch hands out sandwiches randomly, what is the probability that Evan will enjoy his meal?

A) $\frac{1}{2}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{1}{5}$

37. Linda is comparing grades between two Grade 8 Math classes.
The grades in the first class are listed below:
   (56, 57, 59, 61, 64, 66, 67, 68, 71, 71, 72, 73, 73, 74,
   74, 75, 76, 78, 79, 79, 79, 80, 80, 84, 85, 85, 88, 89, 94, 94, 96, 98)
The grades in the second class are listed below:
   (55, 59, 63, 64, 69, 70, 71, 71, 71, 76, 76, 76,
   77, 82, 82, 82, 83, 84, 85, 85, 86, 86, 86, 88, 89, 89, 96)
Linda prepares a bar graph to compare the number of students in the intervals of 50 - 59, 60 - 69, 70 - 79, 80 - 89 and 90 - 99:
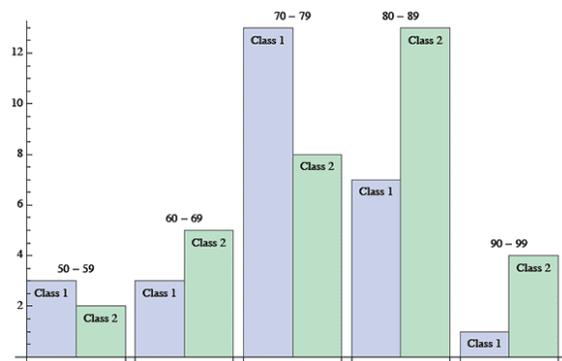
Why is Linda's use of a bar graph not the best choice for representing her data?
A) It is not possible to tell the number of students in each category.
B) The class sizes are different.
C) Linda has not counted the students in the 50 - 59 category correctly.
D) The vertical scale is not uniform and does not begin at zero.

38. Which of the graphs below seems to represent data the best?

A)

B) Each symbol represents 5 bugs

C)

D) 1 symbol = 10 plants

39.

A spinner is divided into 5 equal sections as shown above. The spinner is spun twice.
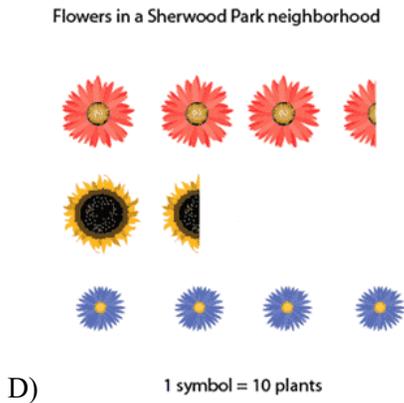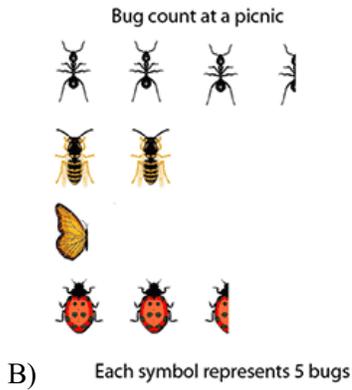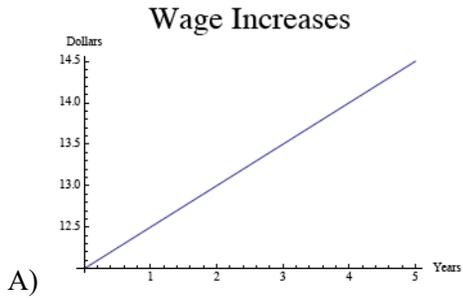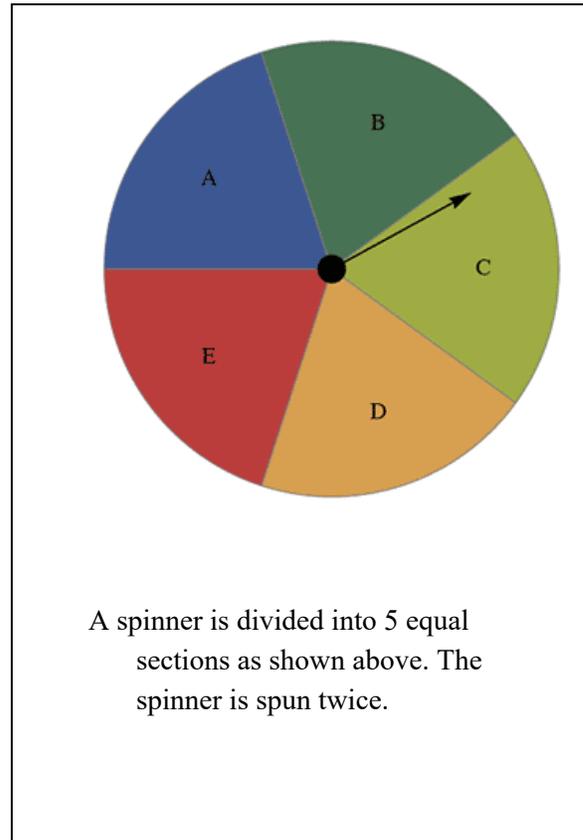
Expressed as a percent, the value of PHE, EL is _____%

40. If you flip a penny, a dime and a loonie, the probability of getting ALL HEADS, expressed as a percent, is _____ % (Report your answer rounded correctly to ONE decimal place.)

Geometry
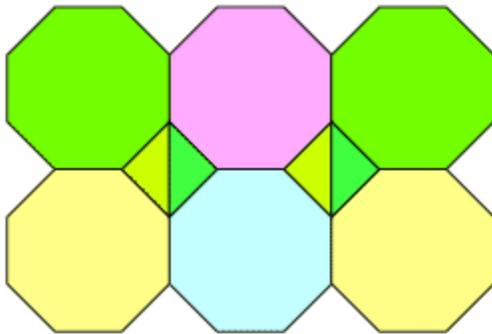
1. Phillip is creating a tessellation with octagons and triangles.
   The three angles in the triangle must be
   A) 45°, 45°, and 90°
   B) 30°, 30°, and 120°
   C) 60°, 60°, and 60°
   D) 45°, 90°, and 90°

2. Which of the shapes shown below will NOT tessellate a plane?
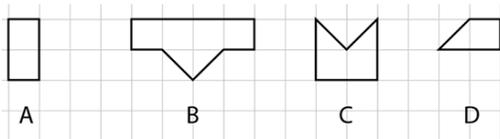

   A) A
   B) B
   C) C
   D) D

3. Punch and Judy are working with a circle and wedges that have different angles.
   They are placing wedges together as seen below until the circle is completed.

   So far, they have placed wedges with angles of 45°, 30°, 60°, 75° and 90°.
   To complete the circle with one more wedge, they should use an angle of _____ °.
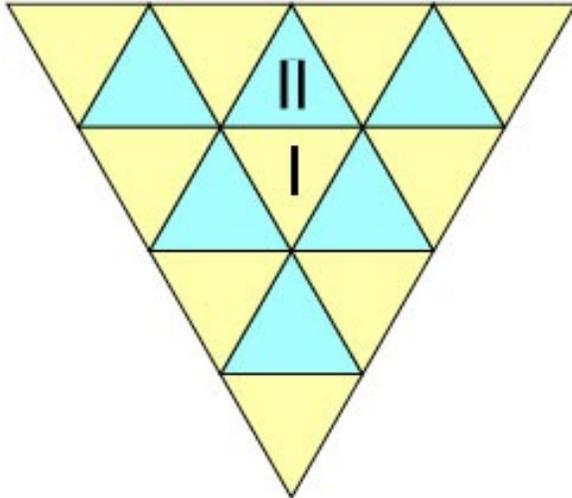
4.

The diagram above shows a tessellation of equilateral triangles. The transformation needed for triangle II to be an image of triangle I is

A) a rotation
B) a reflection
C) a translation
D) all of the above

6.

In the tessellation shown above, the ORIGINAL shape used is labelled I. The image of piece I that results in piece II could be created by

A) a translation only
B) a reflection only
C) a rotation only
D) A or C

5.

Various views of a three dimensional object are shown above.
If each square in the view represents a side view of ONE block, the MAXIMUM number of blocks needed to construct the object is

_____

7.

While babysitting, Patricia watched as two-year old Nicole made the following pattern with her building blocks.

Which of the following represents the top view of Nicole's blocks?

A)

B)

C)

D)

8.   Below is a chart with information about regular polygons with three to ten sides.

| Regular polygon (number of sides)	Size of interior angles
Equilateral triangle (3)	60°
Square (4)	90°
Pentagon (5)	108°
Hexagon (6)	120°
Heptagon (7)	≈128.6°
Octagon (8)	135°
Nonagon (9)	140°
Decagon (10)	144°

What percentage of the polygons in the table can NOT be used to tessellate a plane?

A) 62.5%

B) 50.0%

C) 37.5%

D) 25.0%

9.

Chuck is creating a tessellation and what he has so far is illustrated above.

Which transformation(s) could be used for square II to be an image of square I?

A) a translation

B) a reflection

C) a rotation

D) all of the above
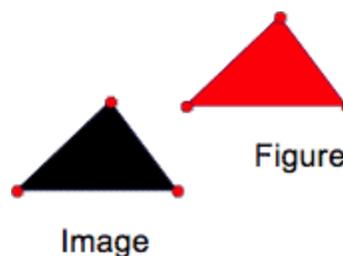
Figure

Image

10.

The red figure and the black image are _____ . (Choose the best answer)

A) rotated

B) congruent

C) reflected

D) dilated

A   B

C   D

11.
Phillip is creating a tessellation with octagons and triangles.
The three angles in the triangle must be
A) 45°, 45°, and 90°
B) 30°, 30°, and 120°
C) 60°, 60°, and 60°
D) 45°, 90°, and 90°

A) A
B) B
C) C
D) D

12.
Some students in a math 8 class were involved in a communication project. They were to describe a 3-D object, and then give this information to another student to see if their descriptions was helpful or not.
One student drew the top view of his object, as shown above. He drew darker lines to show where there was a change in depth.
Which of the following would NOT be a possible representation of his object?

13.

5 objects are shown above. Which of the shapes shown could have a view

that looks like ?

A) Object 2 only
B) Objects 2 and 3
C) Objects 2, 3, and 4
D) Objects 2, 3, 4, and 5

14. Refer to the information in question 3.

5 objects are shown above. Which of the shapes shown could have a view
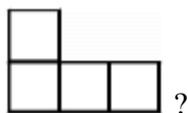
that looks like ?

A) Object 2 only
B) Object 3 only
C) Object 5 only
D) Objects 3 and 5

15. Below is a chart with information about regular polygons with three to ten sides.

| Regular polygon (number of sides)	Size of interior angles
Equilateral triangle (3)	60°
Square (4)	90°
Pentagon (5)	108°
Hexagon (6)	120°
Heptagon (7)	≈128.6°
Octagon (8)	135°
Nonagon (9)	140°
Decagon (10)	144°

If one of the polygons listed was chosen at random, the probability that it could tessellate could be given as A/B.

The sum A + B = _____

16.

Top

Left   Front   Right
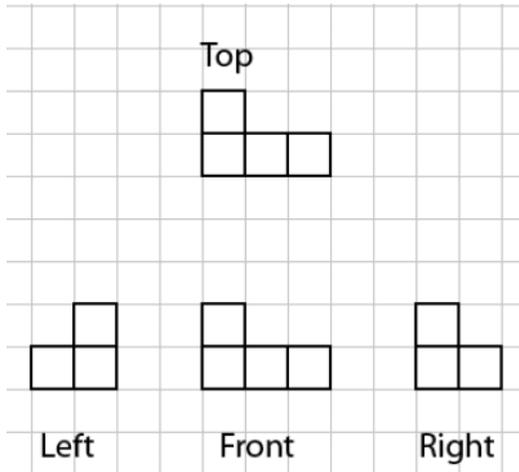
Which of the objects below would have the views shown above?

A)

B)

C)

D)
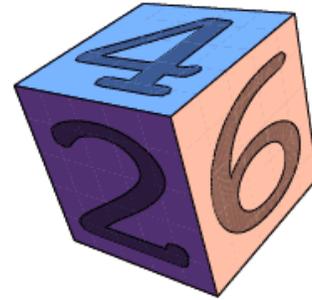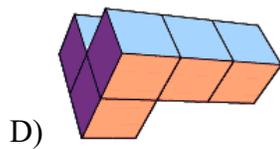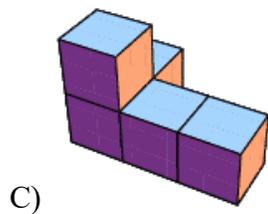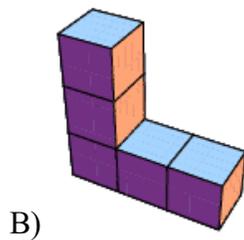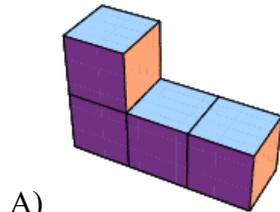
17.

Above is a picture of a numbered cube. The faces of the cube are numbered 1 through 6.

The cube is rotated in space so that it looks like what is shown below:
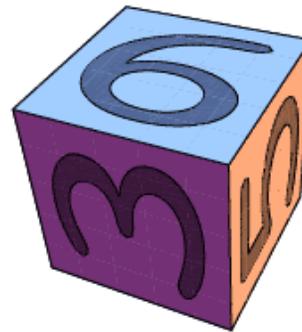
The number 2 is
A) opposite the number 5
B) opposite the number 6
C) opposite the number 3
D) none of the above

18.

While babysitting, Patricia watched as two-year old Nicole made the following pattern with her building blocks.

Which of the following represents the top view of Nicole's blocks?

B)

C)

A)

D)
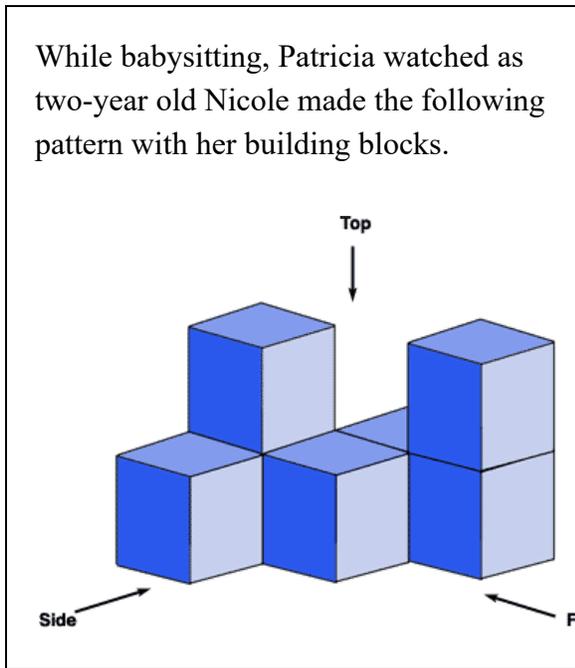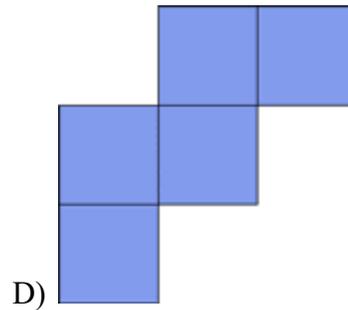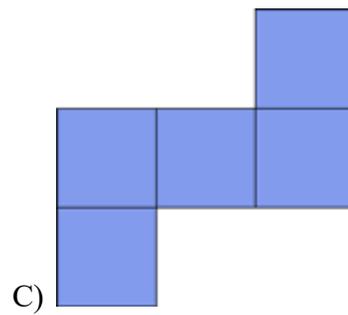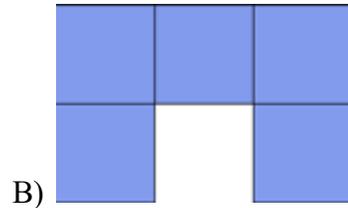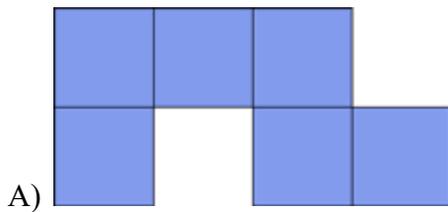
19.

Janice created the above three dimensional shape using blocks.

She showed her object to a friend in her math class, and asked her to draw the front, left, right and top views of the shape.

Assuming that the front is the pink side, which of the views of the object will look the same? Don't worry if the different views are rotated with respect to one another.
A) The top view and front view
B) The right view and left side view
C) The top view and front view
D) All the views will look the same

20.

The diagram above shows a tessellation of equilateral triangles. The transformation needed for triangle II to be an image of triangle I is
A) a rotation
B) a reflection
C) a translation
D) A or B

21. Below is a chart with information about regular polygons with three to ten sides.

Regular polygon (number of sides)	Size of interior angles
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Hexagon (6)	120°
Heptagon (7)	≈128.6°
Octagon (8)	135°
Nonagon (9)	140°
Decagon (10)	144°

What percentage of the polygons in the table can NOT be used to tessellate a plane?
A) 62.5%
B) 50.0%
C) 37.5%
D) 25.0%

22. Amie drew a quadrilateral and labelled all 4 angles. She then made a copy of her quadrilateral by tracing it. She rotated one of the quadrilaterals and ended up with the two forms you see below.
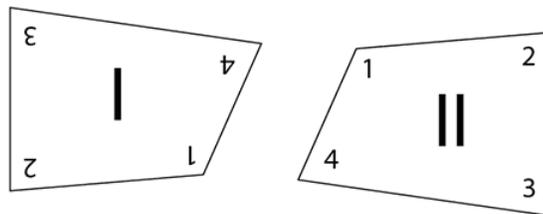
Amie figures she can use these two shapes to make a tessellation.
If she uses the shapes exactly as they are shown, and fits them together properly, which of the following arrangements would create a tessellation?
A) I II
   I II

B) I I
   II II

C) I II
   II I

D) I I
   II I
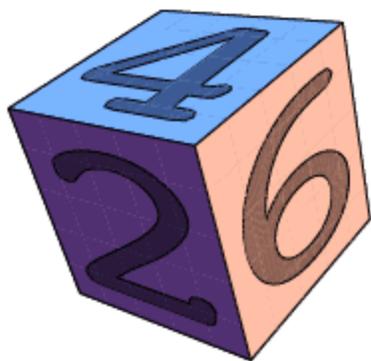
23.
Above is a picture of a numbered cube. The faces of the cube are numbered 1 through 6.
The cube is rotated in space so that it looks like what is shown below:
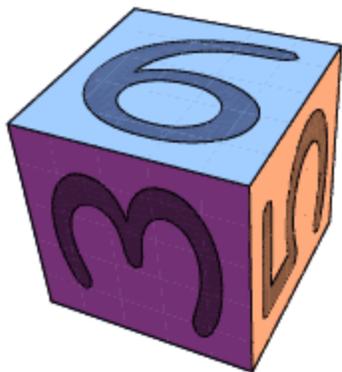

The number 2 is
A) opposite the number 5
B) opposite the number 6
C) opposite the number 3
D) none of the above

24. Which of the following will NOT tessellate a plane?
A) A scalene triangle
B) A rhombus
C) An equilateral triangle
D) An octagon
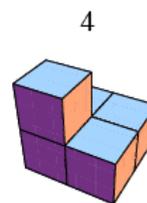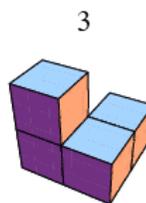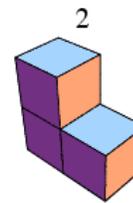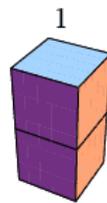
25.
5 objects are shown above. Which of the shapes shown could have a view
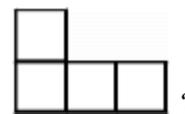
that looks like ____ ?
A) Object 2 only
B) Object 3 only
C) Object 5 only
D) Objects 3 and 5

26. Refer to the information in question 5.
5 objects are shown above. Which of the shapes shown could have a view
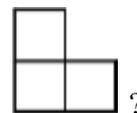
that looks like ____ ?
A) Object 2 only
B) Objects 2 and 3
C) Objects 2, 3, and 4
D) Objects 2, 3, 4, and 5

Top
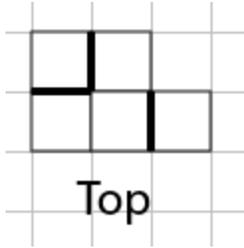
27.

Some students in a math 8 class were involved in a communication project. They were to describe a 3-D object, and then give this information to another student to see if their descriptions was helpful or not.

One student drew the top view of his object, as shown above. He drew darker lines to show where there was a change in depth.

Which of the following would NOT be a possible representation of his object?

A   B

C   D
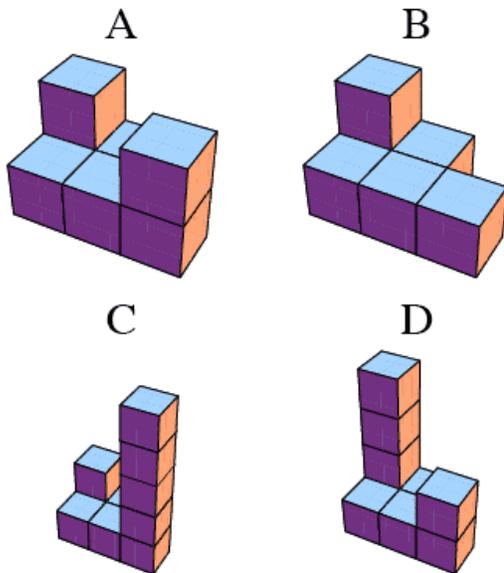
A) A
B) B
C) C
D) D
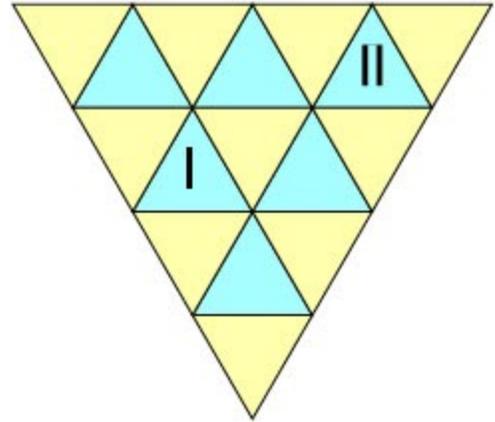
28.

The diagram above shows a tessellation of equilateral triangles. The transformation needed for triangle II to be an image of triangle I is

A) a rotation
B) a reflection
C) a translation
D) all of the above

29. Charlie posed a challenge to some of his friends in math class.

He said that both the top and front views of a 3-D object he had in mind looked like this:
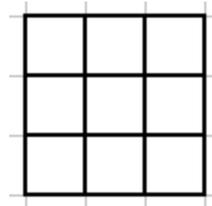
Charlie said that if he were to build the object with linking blocks, the *minimum* number of blocks he would need was X, and the *maximum* number of blocks he would need was Y.

The value of Y - X is _____

30.
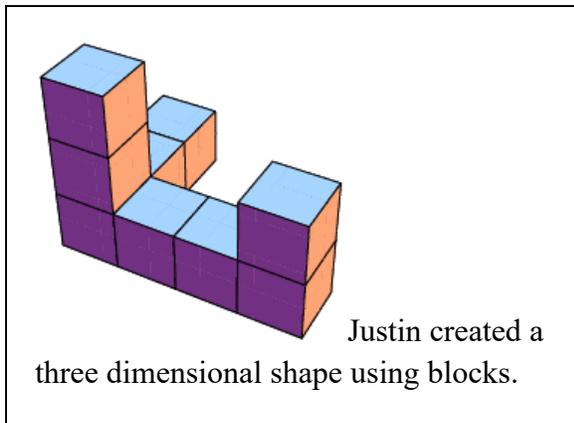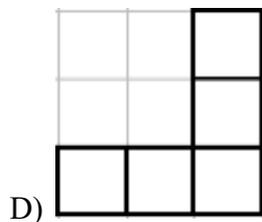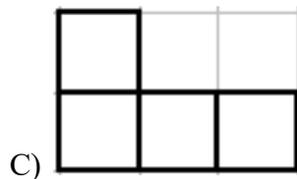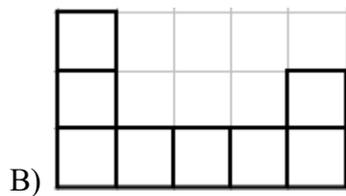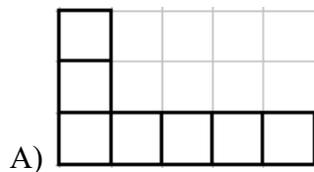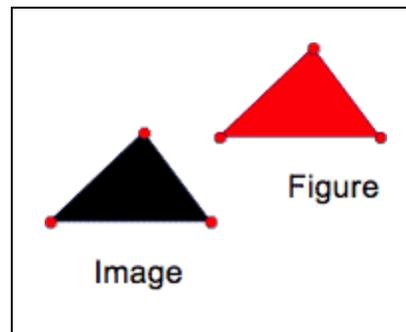
Justin created a three dimensional shape using blocks.

Which of the following could be a view of his object?

A)

B)

C)

D)

31.

The red figure and the black image are _____ . (Choose the best answer)

A) rotated
B) congruent
C) reflected
D) dilated

32.

Justin created a three dimensional shape using blocks.

Which of the following could be a view of his object?

A)

B)

C)

D)
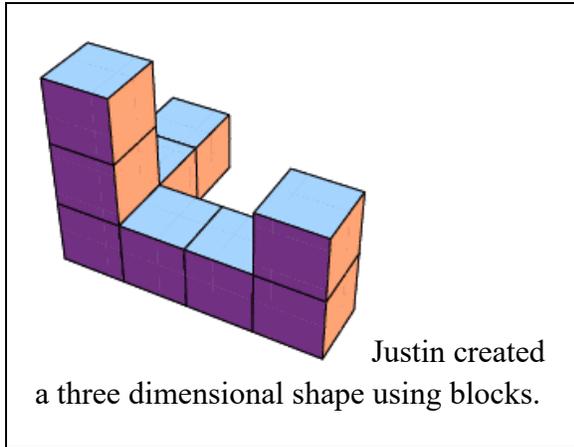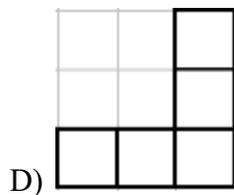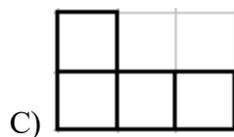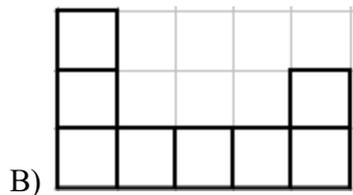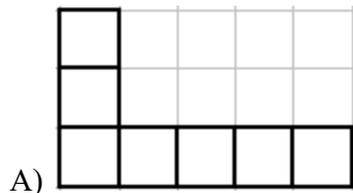
33. Jerry was trying to create a tessellation in the style of M.C. Escher.
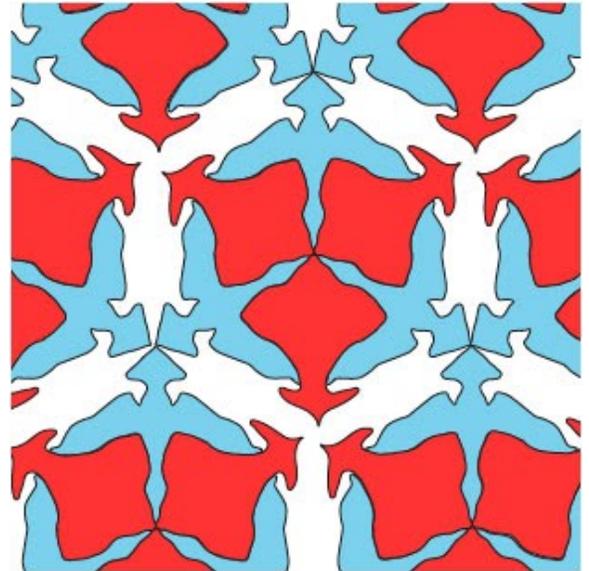
The three blue "bird shapes" could be created by taking one of the shapes and rotating by _____ ° about the point where they meet.
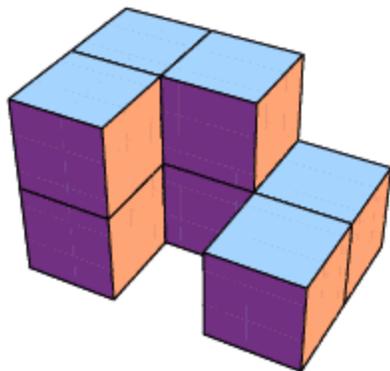
34.

A cube "house" is created out of blocks as shown above.

Looking at the object just as it is shown, with blue being the top, purple the front side, and peach the right side, the following views were created.
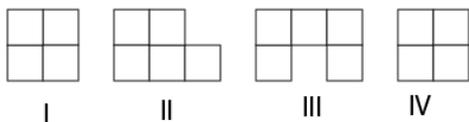
I   II   III   IV

Based on this information, the top, front, left and right views of the "house", in that order, correspond to diagrams

A) I, II, III, and IV

B) I, III, II, and IV

C) III, II, I, and IV

D) III, I, II, and IV

35. The word *isometric* means

A) equal angular

B) equal measure

C) equal area

D) equal volume
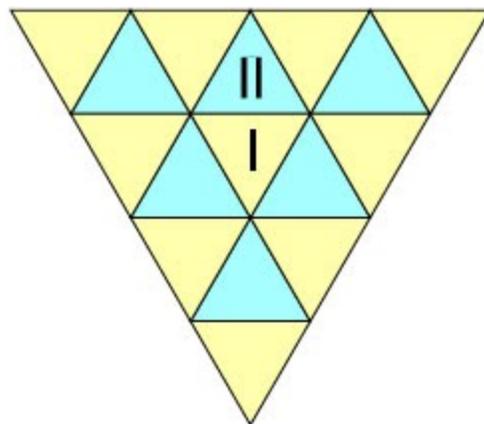
36.

The diagram above shows a tessellation of equilateral triangles. The transformation needed for triangle II to be an image of triangle I is

A) a rotation

B) a reflection

C) a translation

D) all of the above
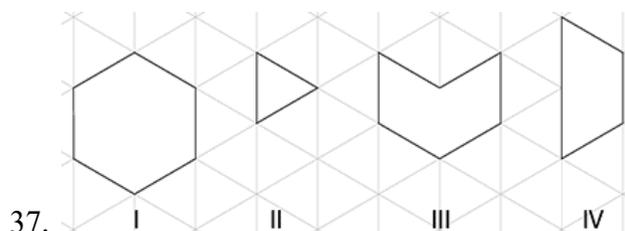
I   II   III   IV

37.

The shapes shown above have been drawn on isometric grid paper. The shapes that will tessellate are

A) I only

B) III only

C) I, II, and IV

D) I, II, III, and IV
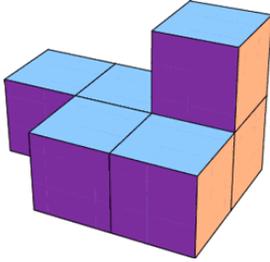
38.
A cube "house" is created out of blocks as shown above.
Looking at the object just as it is shown, with blue being the top, purple the front side, and peach the right side, the following views were created.
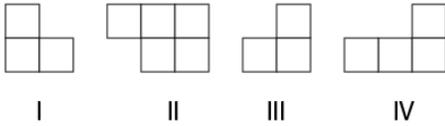
I   II   III   IV

Based on this information, the top, front, left and right views of the "house", in that order, correspond to diagrams
A) I, II, III, and IV
B) II, IV, III, and I
C) IV, III, II, and I
D) II, IV, I, and III
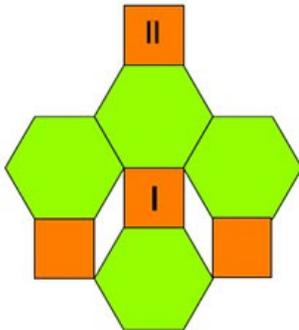
39.
Chuck is creating a tessellation and what he has so far is illustrated above.
Which transformation(s) could be used for square II to be an image of square I?
A) a translation
B) a reflection
C) a rotation
D) all of the above

40.
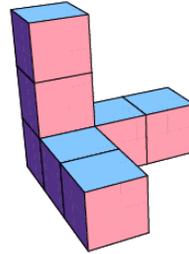
Janice created the above three dimensional shape using blocks.

She showed her object to a friend in her math class, and asked her to draw the front, left, right and top views of the shape.

Assuming that the front is the pink side, which of the views of the object will look the same? Don't worry if the different views are rotated with respect to one another.
A) The top view and front view
B) The right view and left side view
C) The top view and front view
D) All the views will look the same

Integers

1. Doubling an integer could produce a result
   A) greater than the original integer
   B) smaller than the original integer
   C) of zero
   D) all of the above

2. In this problem a red tile represents -1 and a yellow tile represents +1. If Hurley modeled the multiplication (-4) × (-3), then the diagram he used was
   A)
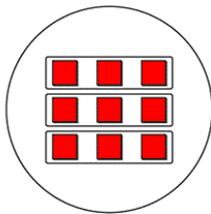
   B)
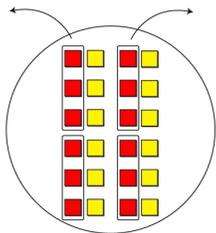
   C)
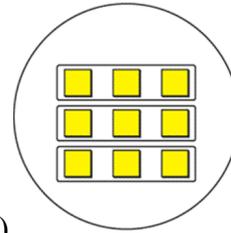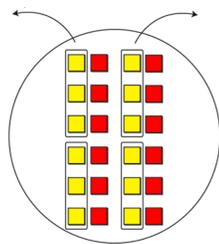
D)

3.
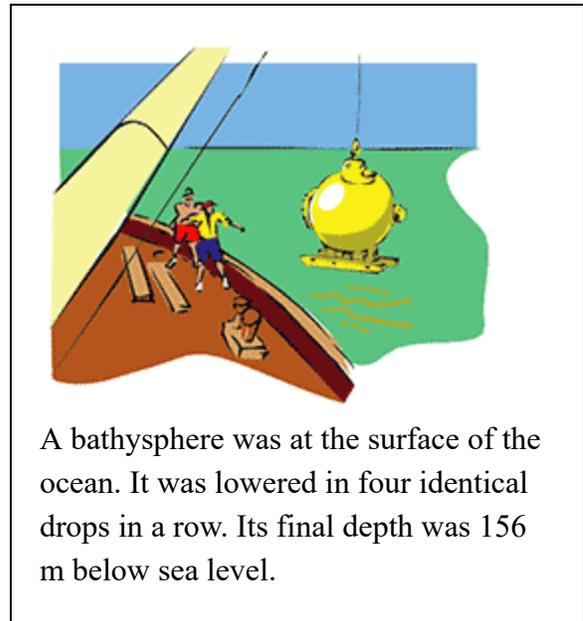
A bathysphere was at the surface of the ocean. It was lowered in four identical drops in a row. Its final depth was 156 m below sea level.

The depth of each drop (m) was
A) 160
B) 624
C) -624
D) -39

4.
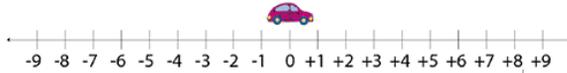
-9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9

A toy car travels along a number line marked in centimeters.

A distance of 1 cm to the right is represented by +1.

A distance of 1 cm to the left is represented by -1.

The car moves 5 cm to the left each second. If the car is at 0 now, when was/will the car be at the 25 cm mark?
A) 20 seconds ago
B) 20 seconds from now
C) 5 seconds ago
D) 5 seconds from now

5. Refer to the information in question 4.
The car moves 4 cm to the right each second.
If the car is at 0 now, when was/will the car be at the -28 cm mark?
A) 7 seconds ago
B) 7 seconds from now
C) 24 seconds ago
D) 24 seconds from now

6. Refer to the information in question 4.
The car moves 3 cm to the left each second.
If the car is at 0 now, when was/will the car be at the -30 cm mark?
A) 27 seconds ago
B) 33 seconds from now
C) 10 seconds ago
D) 10 seconds from now

7. One day, the temperature rose 3°C each hour for a total change of +12 °C. The total number of hours over which this temperature change took place is
A) -9
B) +4
C) +7
D) +15

8. In this problem a red tile represents -1 and a yellow tile represents +1. If Jack modeled the multiplication (-4) × (+3), then the diagram he used was

A)
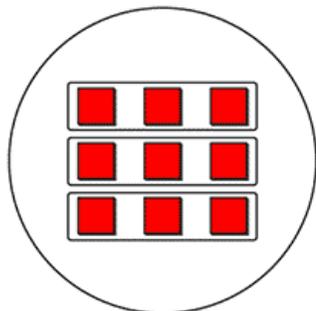
B)
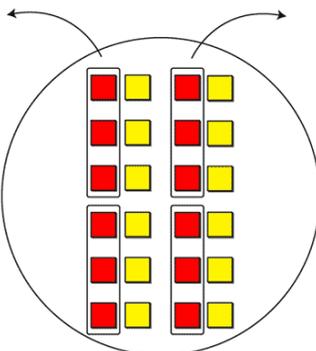
C)
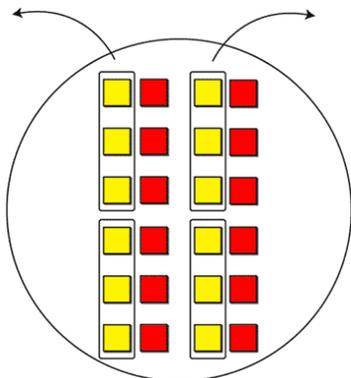
D)
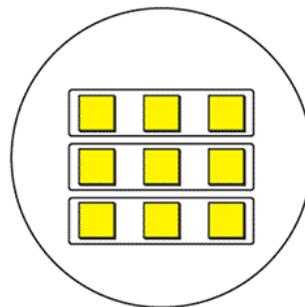
9. A division pattern looks like

$$\text{dividend} \div \text{divisor} = \text{quotient}$$

If the division of two specific integers gives a positive integer quotient that is greater than both integers, then which of the following is FALSE?

A) the dividend must be less than the divisor

B) the dividend must be a multiple of the divisor

C) the divisor is less than the dividend

D) the dividend and the divisor must both be negative

10. What is the result of evaluating:

$$\frac{[18 - (-4)] \div (+11)}{(-4) + 2}$$

A) +1

B) -1

C) +5.5

D) -5.5

11.

The temperature rose 2°C each hour over the course of 6 h.

The total change in temperature is best represented by the integer
A) +12°C
B) -12°C
C) +8°C
D) -8°C

12. Desmond and Charlie were working with a set of integers:

+4, +8, +15, -16, -23 and +42

The *greatest* possible product formed by two of the integers is
A) 240
B) 368
C) 630
D) 966

13.
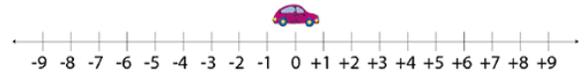
A toy car travels along a number line marked in centimeters.

- A distance of 1 cm to the right is represented by +1.
- A distance of 1 cm to the left is represented by -1.
  The car moves 5 cm to the left each second.
  If the car is at 0 now, when was/will the car be at the 25 cm mark?
  A) 20 seconds ago
  B) 20 seconds from now
  C) 5 seconds ago
  D) 5 seconds from now

14. A division pattern looks like
    dividend ÷ divisor = quotient
    If the division of two specific integers gives an integer quotient that is less than both integers, which of the following conditions could produce the above result?
    A) the dividend is equal to -2
    B) the divisor is equal to +1
    C) the dividend and the divisor are positive
    D) the dividend and the divisor are negative

15. One day, the temperature rose 3°C each hour for a total change of +12 °C. The total number of hours over which this temperature change took place is
    A) -9
    B) +4
    C) +7
    D) +15

16. The result of evaluating (-4) + (-16) ÷ (-4) is
    A) 5
    B) 3
    C) 0
    D) -8

17. The product of two integers is -144. The sum of the integers is -7. The smaller integer is
    A) -16
    B) -12
    C) -9
    D) -8

18. The product of – ☐ × – ◯ would best be represented as:
    A) – – ☐ ◯

    B) – ☐ ◯

    C) ☐ ◯

    D) 2 ☐ ◯

19. In this problem a red tile represents -1 and a yellow tile represents +1. If Jack modeled the multiplication (-4) × (+3), then the diagram he used was

    A)
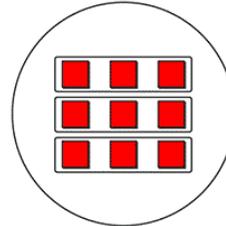
    B)
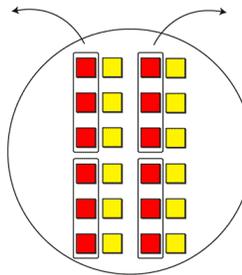
    C)
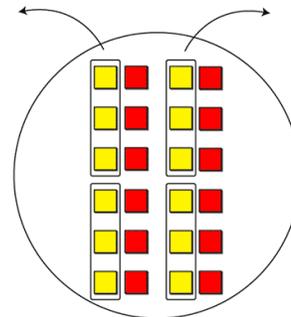
    D)
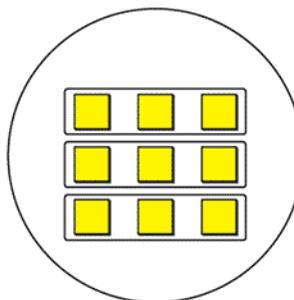
20. The result of evaluating $((-32) \div 4)(6 -(-3))$ is
    A) -8/3
    B) -24
    C) -48
    D) -72

21. What is the result of evaluating:

$$\frac{(-7)(-8)}{(-16) \div [(13) - (+9)]}$$

    A) -14
    B) +14
    C) -4
    D) +4

22. +1, -5, +25, -125, ...
    If the pattern shown above continues, the sum of the next three terms is
    A) -3125
    B) +13 125
    C) -15 625
    D) +19 375

23. A division pattern looks like
          dividend ÷ divisor = quotient
    In order for the division of two integers to give a quotient of +1
    A) the dividend must equal the divisor
    B) the dividend must be the equal and opposite of the divisor
    C) the divisor must be +1
    D) the dividend must be +1

24.

> A red cube (🟥) represents +5 and a blue cube (🟦) represents –2.

What quotient does the diagram below represent?

    A) –5
    B) 5
    C) –80
    D) 80

25. A division pattern looks like
          dividend ÷ divisor = quotient
    If the division of two specific integers gives an integer quotient that is less than both integers, which of the following conditions could produce the above result?
    A) the dividend is equal to -2
    B) the divisor is equal to +1
    C) the dividend and the divisor are positive
    D) the dividend and the divisor are negative

A toy car travels along a number line marked in centimeters.

26. The product of two integers is -120.
    The sum of the integers is +2.
    The *larger* integer is
    A) +6
    B) +8
    C) +10
    D) +12

- A distance of 1 cm to the right is represented by +1.
- A distance of 1 cm to the left is represented by -1.

The car moves 8 cm to the right each second.
If the car is at 0 now, when was/will the car be at the +40 cm mark?
A) 5 seconds ago
B) 5 seconds from now
C) 32 seconds ago
D) 32 seconds from now
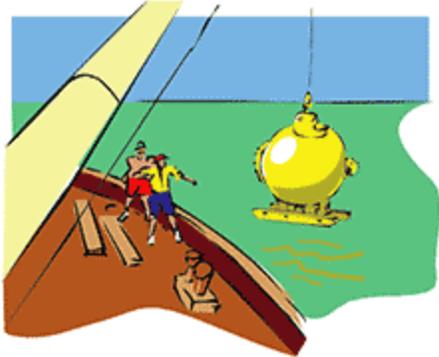
27. Desmond and Charlie were working with a set of integers:
    +4, +8, +15, -16, -23 and +42
    The *greatest* possible product formed by two of the integers is
    A) 240
    B) 368
    C) 630
    D) 966

28. The product of two integers is -144.
    The sum of the integers is -7.
    The smaller integer is
    A) -16
    B) -12
    C) -9
    D) -8

29.

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9

30.

A bathysphere was at the surface of the ocean. It was lowered in four identical drops in a row. Its final depth was 156 m below sea level.

The depth of each drop (m) was
A) 160
B) 624
C) -624
D) -39

31. Desmond and Charlie were working with a set of integers:

  +4, +8, +15, -16, -23 and +42

The *greatest* possible product formed

by two of the integers is
A) 240
B) 368
C) 630
D) 966

32. What is the result of evaluating:

$$\frac{(-7)(-8)}{(-16) \div [(13) - (+9)]}$$

A) -14
B) +14
C) -4
D) +4

33. The result of evaluating (-4) + (-16) ÷ (-4) is
A) 5
B) 3
C) 0
D) -8

34. Juliet was draining her pool to give it a good cleaning. The water level dropped 4 cm per hour for 9 hours.

The change in the water level (cm) is best represented by the integer
A) +36
B) -36
C) -5
D) +5

35. The result of evaluating (-12) ÷ (-4)
    + 6(-2) is
    A) -36
    B) -16
    C) -9
    D) 3

36. The result of evaluating (-7 - (+2)) ×
    3 + (-15) ÷ (-3) is
    A) -108
    B) -22
    C) 22
    D) 108

37. What is the next number in the
    sequence shown below?
    3, -6, 12, -24
    A) –48
    B) +48
    C) –36
    D) +36

38.
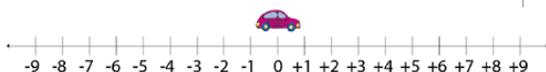
A toy car travels along a number line
    marked in centimeters.

A distance of 1 cm to the right is
    represented by +1. A distance of 1
    cm to the left is represented by -1.
    The car moves 3 cm to the left each
    second.
    If the car is at 0 now, then 4 seconds
    from now the car will be at _____
    cm.

A) +12
B) +20
C) -12
D) -20

39. Refer to the information in question
    8.
    The car moves 5 cm to the left each
    second.
    If the car is at 0 now, when was/will
    the car be at the 25 cm mark?
    A) 20 seconds ago
    B) 20 seconds from now
    C) 5 seconds ago
    D) 5 seconds from now

40. Refer to the information in question
    8.
    The car moves 4 cm to the right each
    second.
    If the car is at 0 now, when was/will
    the car be at the -28 cm mark?
    A) 7 seconds ago
    B) 7 seconds from now
    C) 24 seconds ago
    D) 24 seconds from now

Linear Equations and Graphing

1.

On a school field trip, one teacher must always be present. Furthermore, one **more** teacher must accompany every 10 students on the trip.

If 3 teachers accompanied a group to the Science Centre, what is the maximum number of students that could have gone on the field trip? (Express as an equation and solve.)
A) 10
B) 20
C) 30
D) 40

2. Sharon solved the equation $c/4 + 1 = 4$.
$2 c =$
A) 12
B) 24
C) 36
D) 48

3.

Three junior high school students decide to run a lawn care business over the summer. They agree to split their profits equally each day, and each friend also agrees to donate $15 of their earnings to a local charity. If the business earns D dollars on one day, an equation that represents how much money each student will take home, (E), is
A) E = 3D - 15
B) E = 3D + 15
C) E = D/3 - 15
D) E = D/3 + 15

4. Anna's uncle's age is double her age, less 7 years. If her uncle is 39 years old, how old is Anna?
A) 19.5 years
B) 16 years
C) 23 years
D) 46 years
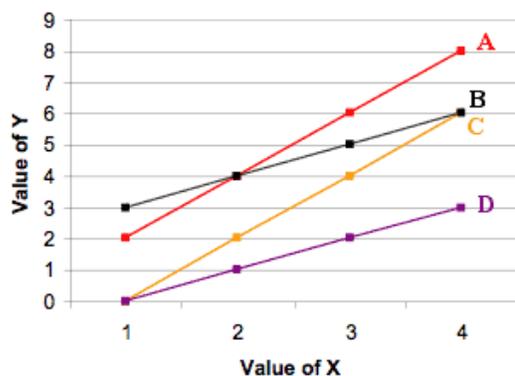
5. Which of the lines on the above graph represents the algebraic equation $2x - 2$?

A) A
B) B
C) C
D) D

6. The sides of a regular octagon are each decreased by 5 cm. If the perimeter of the new octagon is 48 cm, the measure of each side of the original octagon was (Write as an equation and solve.)

A) 11 cm
B) 10 cm
C) 9 cm
D) 8 cm

7. If $-7(p - 5) = -42$, then p =

A) -1

B) -11

C) 1

D) 11

8.

9. After spending $\frac{1}{4}$ of her money, Nicole has $15 left. How much money did she originally have?

A) $18.75
B) $40
C) $60
D) $20

10.

If ▇ represents -x and ● represents 1, then x =

A) -2
B) -1
C) 0
D) 1

11. A Grade 9 entrepreneur is earning some extra money by tutoring Grade 8 Math students. She charges $15 for the first hour, and $10 for every hour after that.

    Her business card has the following formula on it, modeling her fee rate:

    10 (n - 1) = T - 15

    where n represents the number of hours, and T is the total tutoring charge.

    When Andrew got some extra help with the Linear Equations and Graphing unit, his fee was $75. The number of hours that Andrew was tutored for is

    A) 5
    B) 6
    C) 7
    D) 8
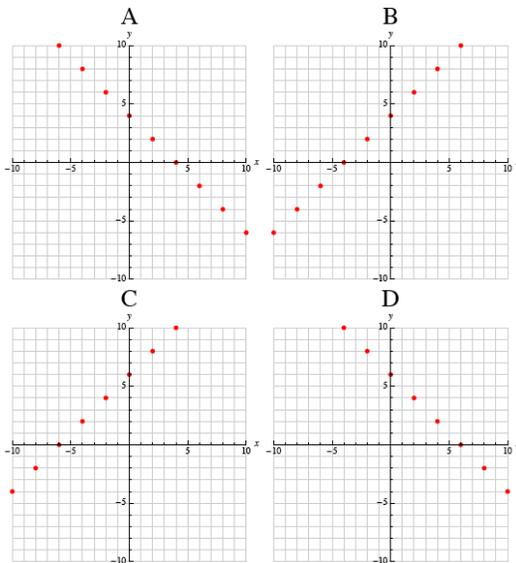
12. Which of the graphs above shows the relationship y = 6 - x?
    A) A
    B) B
    C) C

D) D

13. For the month of February, the average afternoon temperature in the town of Madeup is $\frac{1}{4}$ the average temperature in the city of Unreal. The average afternoon temperature in Madeup is -8 °C.
    The average afternoon temperature in Unreal is
    (Write as an equation and solve.)
    A) -2 °C
    B) -12 °C
    C) -24 °C
    D) -32 °C

Jelly beans in a bag
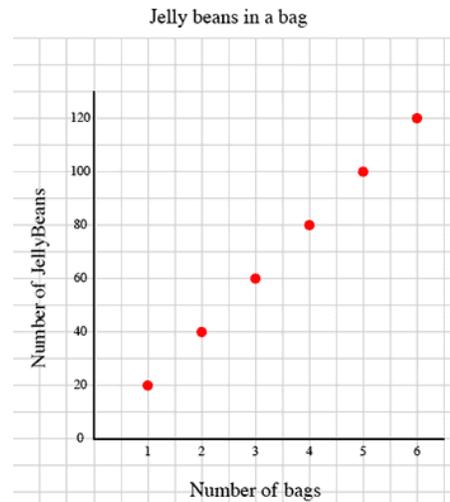
14.

    If J represents jelly beans, and B represents bags, the equation that would relate to the graph shown above is
    A) B = 20 J
    B) J = 20 B
    C) B = 20 + J
    D) J = B + 20

15. Emma is riding her bike. She rides triple the distance from her house to the school, and then 5 km more. The total distance she traveled was 14 km. Which algebraic equation best represents this situation, and how far is it from Emma's house to the school?

    A) $14 = \frac{1}{3}x + 5$; $x = 37$

    B) $14 = 3x + 5$; $x = 3$

    C) $14 = 3x + 5$; $x = 9$

    D) $x = 3(14) + 5$; $x = 47$

16. The base of an isosceles triangle is 12 m less that two times one side. If the base of the triangle is 48 m, then its area (in square meters) is
    A) 18
    B) 30
    C) 432
    D) 864
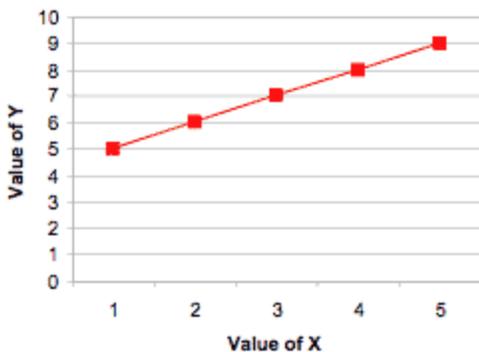
17. The mathematical relationship between x and y shown in the graph above is:
    A) $y = x + 4$
    B) $x = y$
    C) $x = y + 4$
    D) $y = 4x$
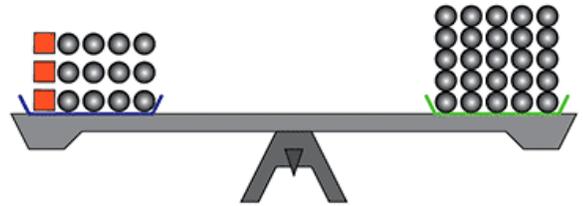
18. What equation is represented by the diagram shown above?
    A) $3(1 + 4) = 5(5)$
    B) $j + 4 = 5(5)$
    C) $3(j + 4) = 25$
    D) $12j + 3 = 25$

19.

37 people are waiting in line for a roller coaster ride. Once they've all boarded, two of the roller coaster trains are full, and 5 empty seats remain in the third.

The number of seats on each train of this roller coaster is
(Write as an equation and solve.)
    A) 8
    B) 10
    C) 12
    D) 14

20. A Grade 9 entrepreneur is earning some extra money by tutoring Grade 8 Math students. She charges $15 for the first hour, and $10 for every hour after that.

    Her business card has the following formula on it, modeling her fee rate:

    10 (n - 1) = T - 15

    where n represents the number of hours, and T is the total tutoring charge.

    When Andrew got some extra help with the Linear Equations and Graphing unit, his fee was $75. The number of hours that Andrew was tutored for is

    A) 5

    B) 6

    C) 7

    D) 8

21.
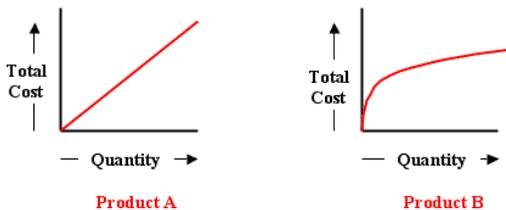
Product A   Product B

    Using the graphs shown above, which product is a better deal if you wanted to buy a large quantity of it?

    A) Product A, because the price remains constant, regardless of the quantity of product purchased.

    B) Product B, because the price remains constant, regardless of the quantity of product purchased.

    C) Product A, because the price per item decreases as you purchase larger quantities.

D) Product B, because the price per item decreases as you purchase larger quantities.
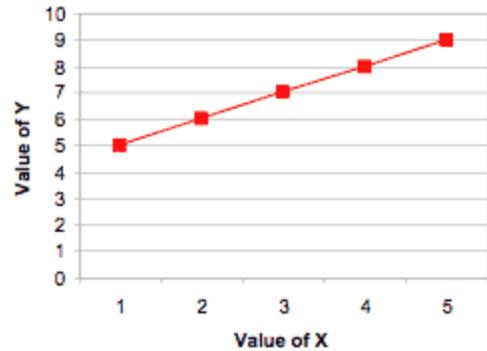
22.

    The mathematical relationship between x and y shown in the graph above is:

    A) $y = x + 4$

    B) $x = y$

    C) $x = y + 4$

    D) $y = 4x$

23. The sides of a regular octagon are each decreased by 5 cm.

    If the perimeter of the new octagon is 48 cm, the measure of each side of the original octagon was

    (Write as an equation and solve.)

    A) 11 cm

    B) 10 cm

    C) 9 cm

    D) 8 cm

24. Bobby has 6 cookies left in his cookie jar. Since he needs some more cookies for the school bake sale, he bakes four batches of cookies. Each batch has the same number of cookies in it. If Bobby ends up with 54 cookies, how many cookies are there in one batch?
    A) 48
    B) 12
    C) 14
    D) 15

25.

If ▇ represents -x and ● represents 1, then x =
    A) -2
    B) -1
    C) 0
    D) 1

26. After spending $\frac{1}{4}$ of her money, Nicole has $15 left. How much money did she originally have?
    A) $18.75
    B) $40
    C) $60
    D) $20

27. A Grade 9 entrepreneur is earning some extra money by tutoring Grade 8 Math students. She charges $15 for the first hour, and $10 for every hour after that.
    Her business card has the following

formula on it, modeling her fee rate:
$10 (n - 1) = T - 15$
where n represents the number of hours, and T is the total tutoring charge.
When Andrew got some extra help with the Linear Equations and Graphing unit, his fee was $75. The number of hours that Andrew was tutored for is
    A) 5
    B) 6
    C) 7
    D) 8

28. If $-7 (p - 5) = -42$, then p =

    A) -1

    B) -11

    C) 1

    D) 11

29. Refer to the information in question 7.
    If the students want the best value for their money, for which number of students would the RED room make the most sense?
    A) 5
    B) 15
    C) 25
    D) 35
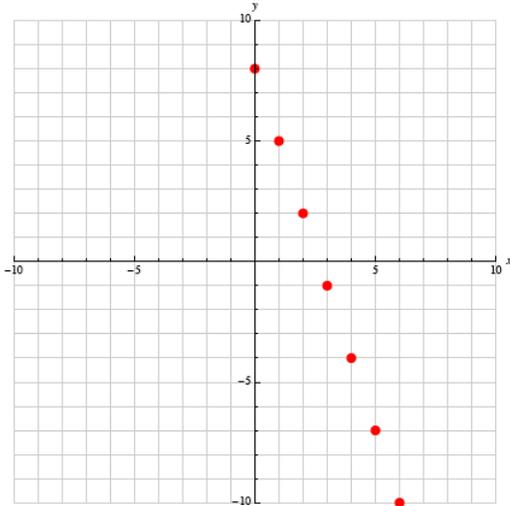
30. Peter made a plot of the equation y = 8 - 3 x, but his grid wasn't large enough to plot the point with an x coordinate of -1.
When x = -1, the value of y is
A) 9
B) 10
C) 11
D) 12
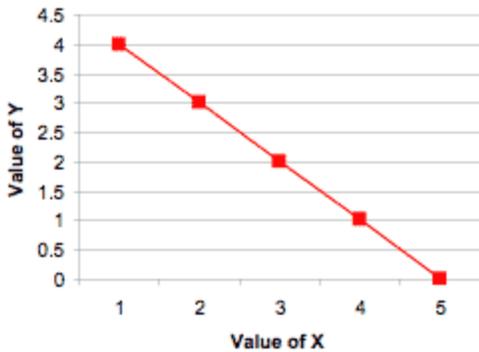
31. The mathematical relationship between *x* and *y* shown in the graph above is:
A) $y = -x - 5$
B) $y = 5x$
C) $y = -x + 5$
D) $y = x + 5$
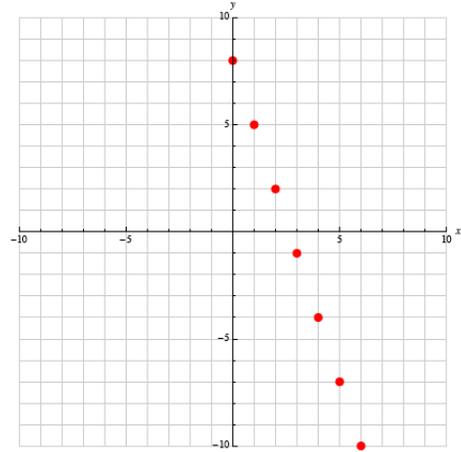
32. Peter made a plot of the equation y = 8 - 3 x, but his grid wasn't large enough to plot the point with an x coordinate of -1.
When x = -1, the value of y is
A) 9
B) 10
C) 11
D) 12

33. Julia's diving score was twice Melissa's score, less 7. If their combined scores were 20, what were their individual scores?
A) Melissa = 9; Julia = 11
B) Julia = 9; Melissa = 11
C) Julia = 13; Melissa = 7
D) Melissa = 7; Julia = 13

34. Sharon solved the equation c/4 + 1 = 4.
2 c =
A) 12
B) 24
C) 36
D) 48

45

35. The sides of a regular octagon are each decreased by 5 cm.
    If the perimeter of the new octagon is 48 cm, the measure of each side of the original octagon was
    (Write as an equation and solve.)
    A) 11 cm
    B) 10 cm
    C) 9 cm
    D) 8 cm
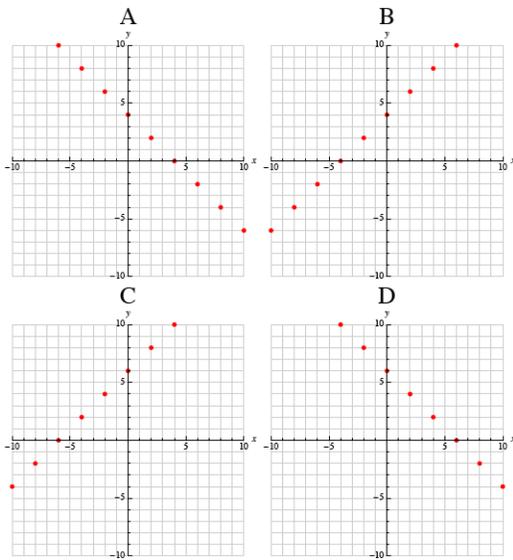
36. Which of the graphs above shows the relationship y = 6 - x?
    A) A
    B) B
    C) C
    D) D

37. If -7 (p - 5) = -42 , then p =
    A) -1
    B) -11
    C) 1
    D) 11
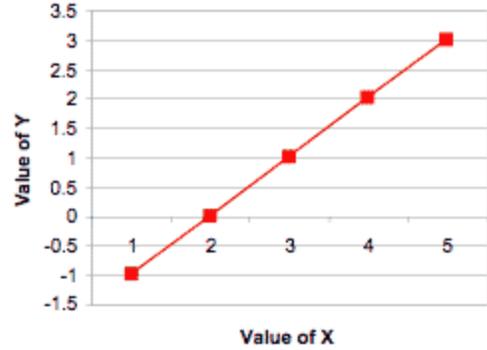
38. The mathematical relationship between x and y shown in the graph above is:
    A) $y = -x$
    B) $y = x - 2$
    C) $y = x - 1$
    D) $x = y - 2$

39. Which of the following tables does NOT represent a linear relation?

A)

x	1	2	3	4	5
y	4	6	8	1	12

B)

x	1	2	3	┌	5
y	5	5	5	5	5

C)

x	-	-2	-2	-2	-2
y	1	3	5	7	9

D)

x	1	2	3	4	5
y	1	4	9	16	25

40.

Points generated by an unknown equation
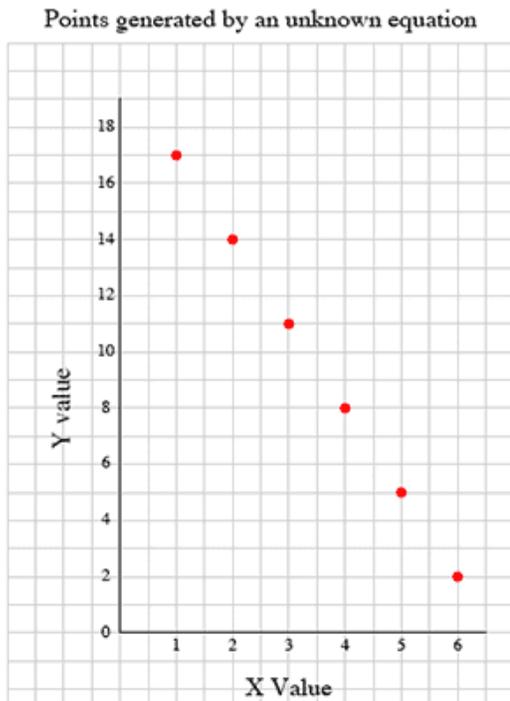
Josh has gotten a graph from his Grade 8 Math teacher. He needs to come up with an equation that would generate the points shown.
Which of the following would be a good choice?
A) y = 20 - x
B) y = 20 - 2 x
C) y = 20 - 3 x
D) y = 21 - 4 x

41. A Grade 9 entrepreneur is earning some extra money by tutoring Grade 8 Math students. She charges $15 for the first hour, and $10 for every hour after that.
Her business card has the following formula on it, modeling her fee rate:
10 (n - 1) = T - 15
where n represents the number of hours, and T is the total tutoring charge.
When Andrew got some extra help with the Linear Equations and Graphing unit, his fee was $75. The number of hours that Andrew was tutored for is
A) 5
B) 6
C) 7
D) 8

Measuring Prisms and Cylinders

8 cm
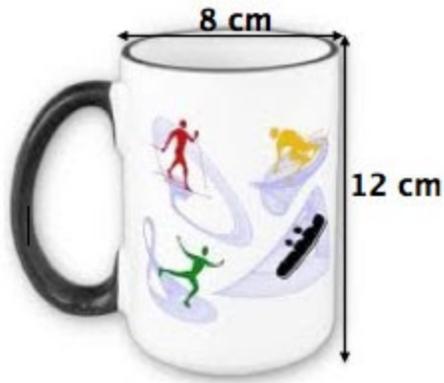
12 cm

1.

Determine the volume of a mug with a diameter of 8 cm and height of 12 cm, to the nearest hundredth of a cubed centimetre. Use 3.14 for π and don't include the unit in your answer.

2. Which is the correct formula to determine the volume of a triangular prism?
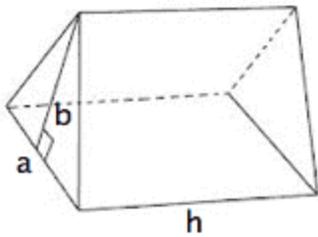
A) $\left(\dfrac{a \times b}{2}\right) \times h$

B) $2\pi r(r + h)$

C) $\left(\pi \times r^2\right) \times h$

D) $\left(\dfrac{2a + 2b}{2}\right) \times h$

Super
Vigor
Crunch

3.

Using the cereal box shown in the diagram above, if the dimensions of the front face of the cereal box is 10 cm wide by 12 cm tall, and the dimensions of the box top is 10 cm wide and 4 cm deep, what is the surface area of the entire cereal box?

A) 416 cm²

B) 208 cm²

C) 400 cm²

D) 200 cm²

A

B

C

D

4.
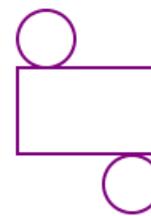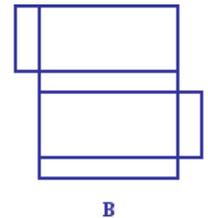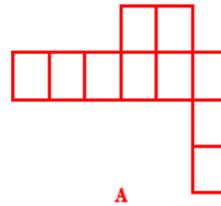
The net shown above, which when folded creates a cylinder, is:

A) A

B) B

C) C

D) D
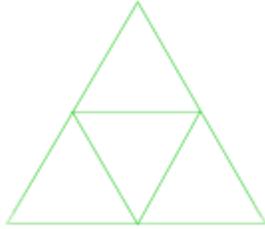
5.

The three-dimensional solid built with the above net is NOT a:

A) Tetrahedron
B) Triangular Pyramid
C) Polyhedron
D) Triangular Prism

30 cm

10 cm

15 cm
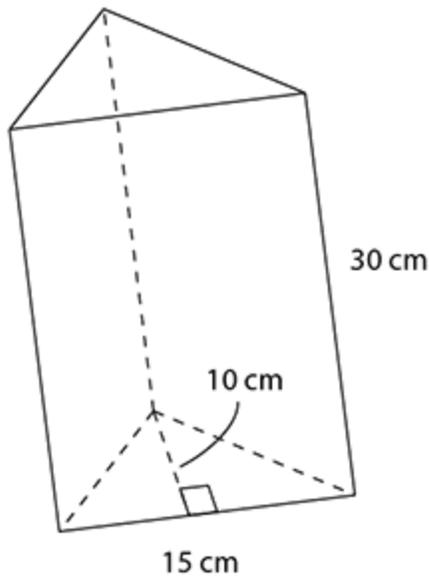
6.

Gerald just purchased an aquarium in the shape of a right triangular prism. If he puts 2000 mL of water into the aquarium, the percent of the volume of the prism that will be occupied by water is
(note that 1 mL of water takes up 1 cm^3)

A) 69%
B) 79%
C) 89%

D) 99%

7.

A die can be made by folding together the following pattern:
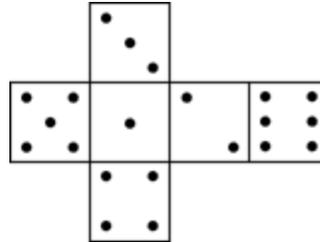
Once it is made, what number is opposite the 2?

A) 2
B) 3
C) 4
D) 5

8. Refer to the information in question 7.

Once it is made, what number is opposite the 4?

A) 2
B) 3
C) 5
D) 6
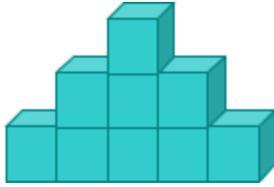
9.

If the surface area of one face is 2 cm^2, what is the surface area of the entire figure shown above?

A) 72 cm^2
B) 68 cm^2
C) 34 cm^2
D) 18 cm^2
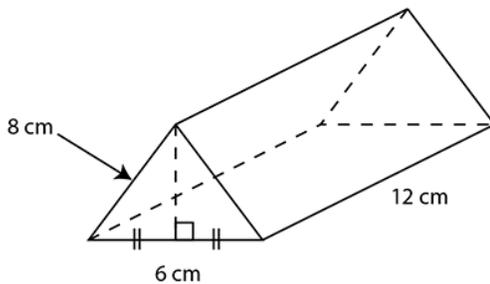
10.

To the nearest square centimeter, the surface area of this right triangular prism is

A) 282
B) 292
C) 302
D) 308

11. If the height of a cylinder in increased by a factor of 2, the volume of the cylinder:

A) Remains the same
B) Decreases by half
C) Decreases by a factor of two
D) Increases by a factor of two

12. A water tank is shaped like a cylinder with a base diameter of 4 m and a height of 20 m. What is the volume to the nearest whole cubic metre? (do not include the unit with your answer)
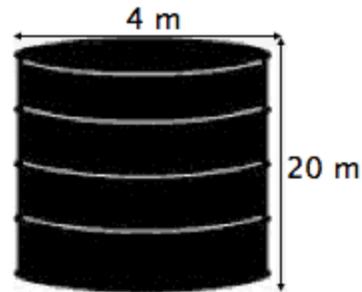
13.

A die can be made by folding together the following pattern:
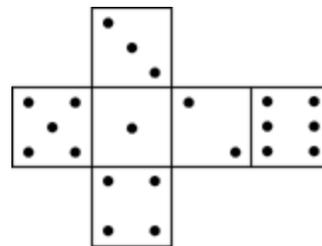
Once it is made, what number is opposite the 1?

A) 6
B) 4
C) 3
D) 2

14. Refer to the information in question 3.
    Once it is made, what number is opposite the 2?
    A) 2
    B) 3
    C) 4
    D) 5

15. A right circular cylinder has a diameter of 12 centimeters and a height of 24 centimeters, as shown.

    —Diameter of 12

    24
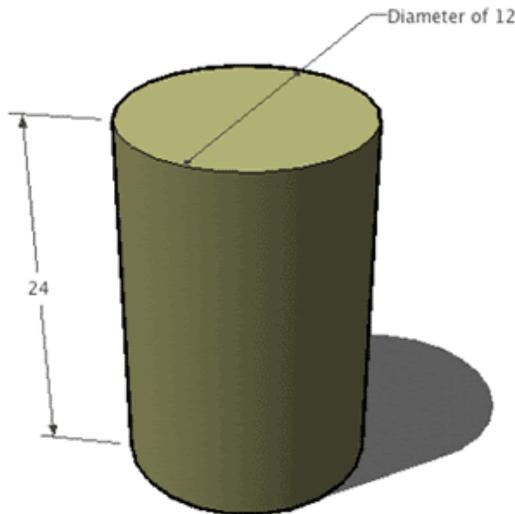
    Using π = 3.14, the volume of the right circular cylinder, to the nearest cubic centimeter, is
    A) 1356
    B) 2713
    C) 5426
    D) 10852

16.

    Super
    Vigor
    Crunch

    Using the cereal box shown in the diagram above, if the dimensions of the front face of the cereal box is 10 cm wide by 12 cm tall, and the dimensions of the box top is 10 cm wide and 4 cm deep, what is the surface area of the entire cereal box?
    A) 416 cm²
    B) 208 cm²
    C) 400 cm²
    D) 200 cm²

17. Which is the correct formula to determine the volume of a triangular prism?

    b

    a

   h

    A) $\left(\dfrac{a \times b}{2}\right) \times h$

    B) $2\pi r(r + h)$

    C) $(\pi \times r^2) \times h$

    D) $\left(\dfrac{2a + 2b}{2}\right) \times h$

B) 6029
C) 3014
D) 1507
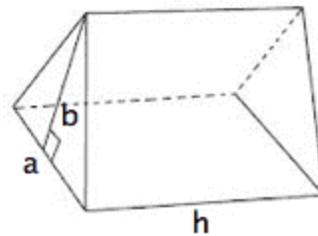
18.

A family owns a cottage by a lake, and they are drilling for a water supply. The drill is about 14 cm wide.

If water is found at a depth of 25 m, about how much soil was removed? (use $\pi = 3.14$)

A) 384 650 cm³
B) 384 700 cm³
C) 384 750 cm³
D) 384 800 cm³

19. A right circular cylinder has a radius of 8 cm and a length of 15 cm, as shown below.

8

15
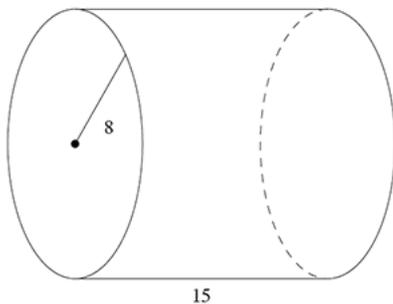
Using $\pi = 3.14$, the volume of the right circular cylinder to the nearest cubic cm is

A) 24115
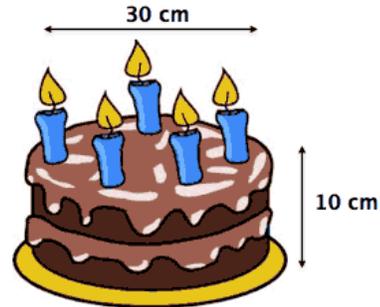
30 cm

10 cm

20.

It is your birthday and you have a round cake that is 30 cm wide by 10 cm tall. What is the volume of the cake to the nearest whole centimetre cubed? Use 3.14 for π and don't include the unit in your answer.

21. Calculate the surface area of the following cylinder to the nearest whole metre squared.

(Don't include the unit with your answer).
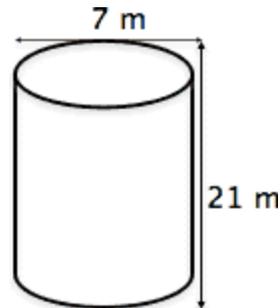
7 m

21 m

22.

A die can be made by folding
together the following pattern:

Once it is made, what number is
opposite the 1?
A) 6
B) 4
C) 3
D) 2

23. Refer to the information in question
2.
Once it is made, what number is
opposite the 4?
A) 2
B) 3
C) 5
D) 6
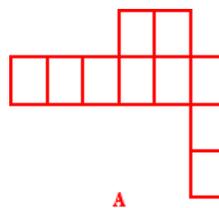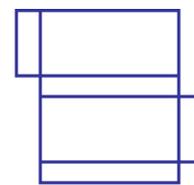
24.

The net shown above, which when
folded creates a cylinder, is:
A) A
B) B
C) C
D) D
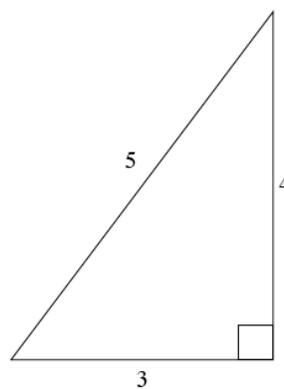
25.

The triangle shown above is one base
of a right triangular prism. The
dimensions are in cm.
What should the length of the prism
be so that its surface area is between
100 cm^2 and 150 cm^2?
A) 7 cm - 9 cm
B) 7 cm - 12 cm
C) 8 cm - 10 cm
D) 8 cm - 12 cm

B)

C)

D)

26.

Determine the volume of a mug with a diameter of 8 cm and height of 12 cm, to the nearest hundredth of a cubed centimetre. Use 3.14 for π and don't include the unit in your answer.
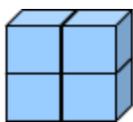
27.

Rita has numerous small cubes that she can arrange to make various shapes, as she has done with the 4 cubes shown in the diagram above. How many more cubes does she need to add to this structure to make the shape of a larger cube?

A) 2
B) 4
C) 8
D) 16

29. A can of pop has a height of 15 cm and a diameter of 6 cm. Determine the volume of pop that can fit in the can.

Your answer must be rounded to the nearest whole cubic centimetre (do not include the unit when entering your answer).
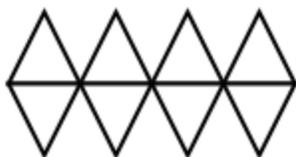
28.

The net shown above, when folded, creates which 3-D figure?

A)

30.

6cm
15 cm

31. The dimensions of a cylinder that would result in the largest surface area from below is a radius of _____ and a height of _____. Use 3.14 for π.
A) 2 cm, 4 cm
B) 4 cm, 3 cm
C) 3 cm, 3 cm
D) 4 cm, 2 cm
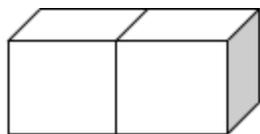
32.

Which of the nets shown below is the net which creates the 3-D figure shown in the diagram above?

A)

B)

C)

D)
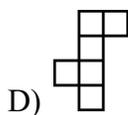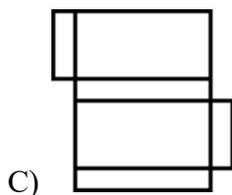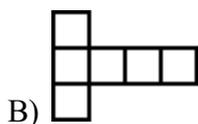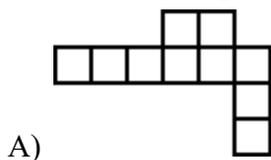
33. A 3 L can of paint covers approximately 25 square meters of wall.
How many cans of paint are needed to paint the walls of a large room that is 8 m long, 4 m wide and 5 m high (with one coat only)?
A) 9
B) 7
C) 6
D) 5

34. Which of the mathematical expressions below is the formula used to find the surface area of a cylinder? (Assume that r = radius; h = height)
A) $\pi r^2 + \pi r^2 h$
B) $2\pi r^2 h$
C) $\pi r^2 h$
D) $2\pi r^2 + 2\pi rh$

12 cm
3 cm

35.
A flashlight is cylindrical. The circular part has a radius of 3 cm and the length of the flashlight is 12 cm. What is the surface area of the flashlight to the nearest tenth of a centimetre squared? Use 3.14 for π and don't include the unit in your answer.
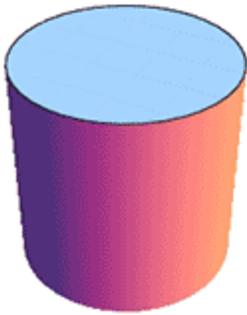
36.
Rachel was trying to create a net that would form a cylinder.
The diagram shown below that is a net of a cylinder is

A)

B)
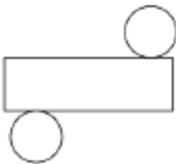
C)

D)
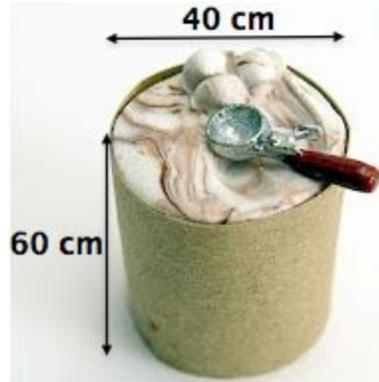
37.
A parlor serves different flavours of ice cream out of plastic buckets. Each ice cream bucket has a diameter of 40 cm and is 60 cm tall. What is the volume of one of these ice cream buckets to the nearest hundredth of a cubed **metre**? Use 3.14 for π and don't include the unit in your answer.
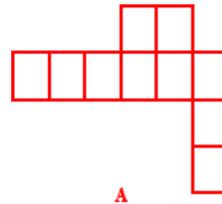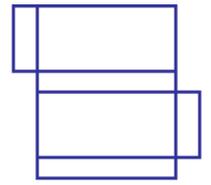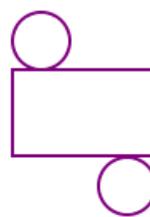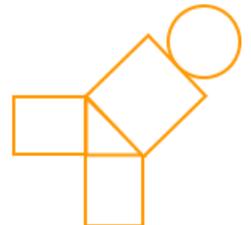
38.
The net shown above, which when folded creates a cylinder, is:
A) A
B) B
C) C
D) D

39. The dimensions of the cylinder that would result in the largest volume are a radius of _____ and a height of _____. Use 3.14 for π.
   A) 5 cm, 6 cm
   B) 7 cm, 6 cm
   C) 4 cm, 13 cm
   D) 10 cm, 10 cm
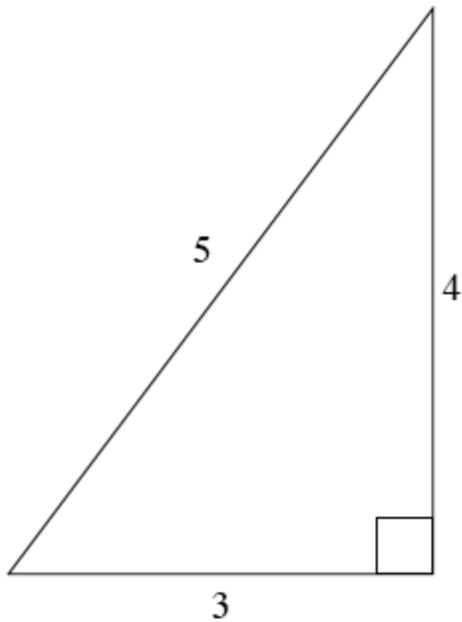
40.
   The triangle shown above is one base of a right triangular prism. The dimensions are in cm.
   What should the length of the prism be so that its surface area is between 100 cm² and 150 cm²?
   A) 7 cm - 9 cm
   B) 7 cm - 12 cm
   C) 8 cm - 10 cm
   D) 8 cm - 12 cm

41. The volume of a box is 7923 cubic meters. If its base has an area of 57 square meters, what is its height?
   A) 138 meters
   B) 139 meters
   C) 140 meters
   D) 141 meters

Operations With Fractions

1. Shawn has the following mathematical expression which contains a mystery number:

$$\frac{2}{7} \times \frac{??}{2}$$

   If Shawn is told that this expression has a value of one, then the mystery number is:

   A) 14
   B) 10
   C) 7
   D) 12

2. The product of two fractions is $\frac{1}{24}$. The sum of the same two fractions is $\frac{11}{24}$.

   The two fractions are

   A) $\frac{1}{6}$ and $\frac{1}{4}$

   B) $\frac{1}{3}$ and $\frac{1}{8}$

   C) $\frac{1}{2}$ and $\frac{1}{12}$

   D) $\frac{1}{2}$ and $\frac{5}{12}$

3.

   While looking in the pantry Jennifer notices that she has 13 tins of cat food on hand. Each time she feeds her cat, the cat gets $\frac{5}{6}$ of a tin (the food, not the tin...!). Jennifer always keeps any leftover food in the fridge and includes it as part of the next feeding.

   When the cat gets the last of the food (from the 13th tin), it won't be a full serving and it will be time to go to the pet store! The size of this last serving will be ____ sixths of a tin.

   A) 1
   B) 2
   C) 3
   D) 4

4. An expression equivalent to $\frac{5}{7} \div \frac{1}{3}$ is:

   A) $\frac{1}{3} \times \frac{5}{7}$

   B) $\frac{15}{21} \times \frac{7}{21}$

   C) $\frac{5}{7} \times 3$

   D) $\frac{7}{5} \times \frac{1}{3}$

5.

James wants to spend $\frac{3}{5}$ of an hour reviewing each unit before his big math test tomorrow, but he only has 6 hours to study.
The number of units James can study in that time is
A) 8
B) 9
C) 10
D) 11

6.

Glenn saved up money from his part time job and used $\frac{5}{8}$ of his savings to buy a DVD player and 7 DVDs. The cost of the DVD player was $\frac{3}{5}$ of the amount he spent.
The fraction of Glenn's money spent on the DVDs was

A) $\frac{31}{40}$

B) $\frac{9}{40}$

C) $\frac{3}{4}$

D) $\frac{1}{4}$

7. Evaluate: $\frac{14}{15} \div 4\frac{2}{3} \times \frac{5}{8} + 2\frac{3}{4}$

A) $2\frac{1}{8}$

B) $2\frac{3}{8}$

C) $2\frac{5}{8}$

D) $2\frac{7}{8}$

8. Olivia is using a long piece of ribbon to make some crafts. If the ribbon is $3\frac{3}{4}$ meters in length, how many $\frac{1}{3}$ meter lengths can she cut from the ribbon?
A) 10
B) 1
C) 11
D) 12

9. Nathan evaluated the expression

$\frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{3}{8} + \frac{1}{4})$

His reduced answer was in the form A/B.

B - A =

A) 40

B) 39

C) 38

D) 37

10.

The students of a Grade 8 Science class are performing several different experiments during a session in the school lab.

They are working in pairs, and some of them will be working with acetic acid (vinegar). Each pair of students working with acetic acid will need

$\frac{3}{16}$ of a cup for the experiment.

If the science teacher only has $\frac{3}{4}$ of a cup of vinegar on hand, the number of pairs of students who can perform the vinegar experiment is

A) 5

B) 4

C) 3

D) 2

11. Mary-Ann just made a batch of delicious Belgian waffles and she is going to share them with her friends.

Each portion will be $\frac{3}{4}$ of a waffle,

and she has $5\frac{1}{4}$ waffles.

The number of portions she can get is

A) 7

B) 6

C) 5

D) 4

12. Justin completed his Grade 8 Math assignment using his computer. That night, while he was sleeping, a computer virus completely destroyed

$\frac{4}{5}$ of this work.

In the morning, while transferring his assignment to a USB flash drive so he could take it to school, a disk

error erased $\frac{1}{4}$ of the remaining work.

The fraction of all of Justin's original hard work that he will still be able to submit to his teacher is

A) $\frac{1}{5}$

B) $\frac{1}{20}$

C) $\frac{3}{20}$

D) $\frac{17}{20}$

13.

It takes $\frac{2}{3}$ of an hour to pick all the apples on one tree at the Smith's farm in Summerland, B.C.
There are 27 trees on the farm.
In order to pick all the apples, it will take ____ minutes.
A) 540
B) 720
C) 1080
D) 2400
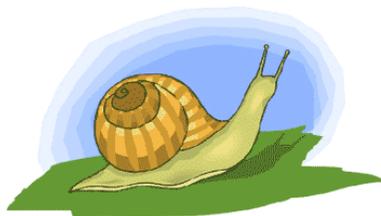
14.

A snail travelled 54 cm in $\frac{2}{5}$ h.
In one hour the snail would travel ____ cm.
A) 130
B) 135
C) 140
D) 145

15. Olivia is using a long piece of ribbon to make some crafts. If the ribbon is $3\frac{3}{4}$ meters in length, how many $\frac{1}{3}$ meter lengths can she cut from the ribbon?
A) 10
B) 1
C) 11
D) 12

16. Nathan evaluated the expression
$\frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{3}{8} + \frac{1}{4})$
His reduced answer was in the form A/B.
B - A =
A) 40
B) 39
C) 38
D) 37
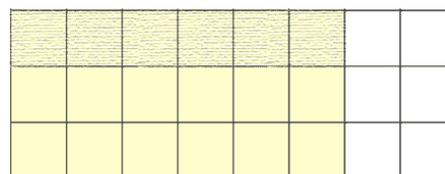
17.

Gwen was using an area model to help her multiply two fractions. The multiplication expression modeled by the diagram is
A) $\frac{1}{3} \times \frac{6}{8}$

B) $\frac{1}{4} \times 24$

C) $\frac{6}{8} \times 24$

D) $\frac{1}{2} \times \frac{6}{12}$

18.

Glenn saved up money from his part time job and used $\frac{5}{8}$ of his savings to buy a DVD player and 7 DVDs. The cost of the DVD player was $\frac{3}{5}$ of the amount he spent.
The fraction of Glenn's money spent on the DVDs was

A) $\frac{31}{40}$

B) $\frac{9}{40}$

C) $\frac{3}{4}$

D) $\frac{1}{4}$

19.

James wants to spend $\frac{3}{5}$ of an hour reviewing each unit before his big math test tomorrow, but he only has 6 hours to study.
The number of units James can study in that time is
A) 8
B) 9
C) 10
D) 11

20. Marcie took $16\frac{1}{3}$ hours to build a model car. She worked $1\frac{1}{6}$ hours each evening.
The number of evenings it took Marcie to complete her model was
A) 13
B) 14
C) 15
D) 16

21. $3 \times 2\frac{3}{4} =$

A) $\frac{31}{4}$

B) $\frac{33}{4}$

C) $\frac{35}{4}$

D) $\frac{37}{4}$

22. The elephant keeper at the zoo prepared $1\frac{1}{3}$ buckets of apples for the elephants' breakfast. If the elephants ate $\frac{3}{4}$ of all the apples, how many buckets of apples did they eat?
    A) 0.75 buckets
    B) 1 bucket
    C) $1\frac{1}{2}$ buckets
    D) 0.25 buckets

23.

Janet used a grid to help her calculate $\frac{4}{5} \times 7$

The number of sections of the grid that need to be shaded in is
    A) 11
    B) 12
    C) 28
    D) 35

24.
One-third of the students in a Grade 8 Math class are wearing hats. One half of the students wearing hats are girls.
What fraction of the students in the Grade 8 Math class do the girls wearing hats represent?

A) $\frac{2}{5}$

B) $\frac{1}{6}$

C) $\frac{5}{6}$

D) $\frac{2}{3}$

25.
The students of a Grade 8 Science class are performing several different experiments during a session in the school lab.
They are working in pairs, and some of them will be working with acetic acid (vinegar). Each pair of students working with acetic acid will need $\frac{3}{16}$ of a cup for the experiment.

If the science teacher only has $\frac{3}{4}$ of a cup of vinegar on hand, the number of pairs of students who can perform the vinegar experiment is
    A) 5
    B) 4
    C) 3
    D) 2

26.

Tony used a number line to calculate

$5 \times \frac{3}{4}$ and correctly determined that the answer is

A) $\frac{5}{4}$

B) $\frac{15}{20}$

C) $\frac{8}{9}$

D) $\frac{15}{4}$

27. If you multiply two positive fractions, the result could be
A) greater than both fractions
B) less than both fractions
C) equal to one
D) all of the above

28. The students in a Grade 8 Math class are baking cookies for a charity bazaar. Trish baked $2\frac{1}{2}$ dozen cookies. John baked $2\frac{5}{6}$ times as many cookies as Trish.
The number of cookies John baked is
A) 85
B) 80
C) 75
D) 70
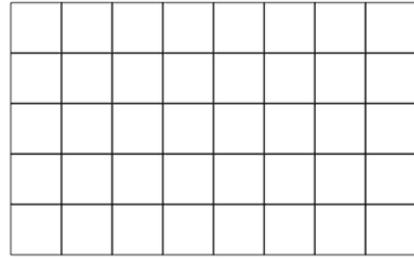
29.
Gwen used a divided rectangle to help her model the multiplication $\frac{3}{5} \times \frac{7}{8}$

When Gwen correctly completes her model, the number of squares representing the answer will be
A) 10
B) 13
C) 21
D) 40
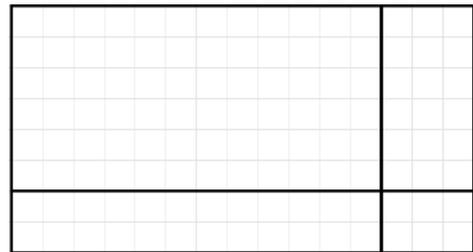
30.
Gary used an area model to multiply $2\frac{1}{2} \times 1\frac{1}{3}$. The result of the multiplication would be represented by the sum

A) $2 + 1 + \frac{1}{2} + \frac{1}{3}$

B) $2 + 1 + \frac{2}{3} + \frac{1}{2}$

C) $2 + 1 + \frac{1}{3} + \frac{1}{6}$

D) $2 + \frac{1}{2} + \frac{2}{3} + \frac{1}{6}$

31. Shawn has the following mathematical expression which contains a mystery number:

$$\frac{2}{7} \times \frac{??}{2}$$

If Shawn is told that this expression has a value of one, then the mystery number is:

A) 14
B) 10
C) 7
D) 12

32.

Janelle gets a summer job planting trees.

One day, her boss checked how hard she was working. While her boss was watching, Janelle worked for $\frac{7}{12}$ of an hour and planted 5 trees.

If Janelle takes pretty much the same amount of time per tree, how many minutes does it take her to plant just one tree?

A) 4
B) 5
C) 6
D) 7

33. An expression equivalent to $\frac{5}{7} \div \frac{1}{3}$ is:

A) $\frac{1}{3} \times \frac{5}{7}$

B) $\frac{15}{21} \times \frac{7}{21}$

C) $\frac{5}{7} \times 3$

D) $\frac{7}{5} \times \frac{1}{3}$

34. Barry went on a trip with his family to an amusement park.

He took $42 with him and spent $\frac{5}{7}$ of his money on rides. He saved the rest for snacks.
The amount of money (in $) Barry had left to spend on food was

A) 12
B) 24
C) 30
D) 84

35. While looking in the pantry Jennifer notices that she has 13 tins of cat food on hand. Each time she feeds her cat, the cat gets $\frac{5}{6}$ of a tin (the food, not the tin...!). Jennifer always keeps any leftover food in the fridge and includes it as part of the next feeding.
When the cat gets the last of the food (from the 13th tin), it won't be a full serving and it will be time to go to the pet store! The size of this last serving will be _____ sixths of a tin.

A) 1
B) 2
C) 3
D) 4

36. If you multiply two positive mixed fractions, the result could be
    A) greater than both fractions
   B) less than both fractions
    C) equal to one
    D) less than one

37. $3 \times 2\frac{3}{4} =$
    A) $\frac{31}{4}$

    B) $\frac{33}{4}$

    C) $\frac{35}{4}$

    D) $\frac{37}{4}$

38.
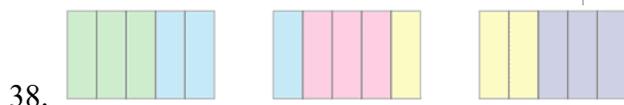
    Connor used the picture above to model a division.
    The division he modeled is BEST described by:
    A) $3 \div \frac{5}{3} = \frac{9}{5}$

    B) $3 \div \frac{3}{5} = 5$

    C) $5 \div 3 = \frac{5}{3}$

    D) $5 \div \frac{5}{3} = 3$

39. Jeffrey is working with the numbers 2, 3, 7 and 9, and the division pattern
    $$\frac{\square}{\square} \div \frac{\square}{\square}$$

Using his numbers, the SMALLEST quotient Jeffrey can obtain is

A) $\frac{2}{21}$

B) $\frac{1}{21}$

C) $\frac{6}{7}$

D) $\frac{2}{63}$
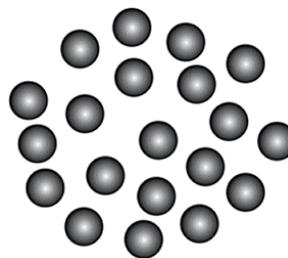
40.

    John used counters to help him find $\frac{2}{3}$ of 21.
    To do this, John divided the counters into piles of
    A) 14
    B) 7
    C) 3
    D) 2

Percent, Ratio and Rate

1.

> Rob and Martina purchased some land to create a tree farm. The land measures 191 m by 412 m. They plant 12 650 seedlings.

How many seedlings will they have to plant for every 100 m², if they want to evenly spread the trees on the land?
A) 6
B) 16
C) 226
D) 622

2. Which of the following items costs the most per unit price?
A) $15 for a 250 mL bottle of vanilla extract
B) $60 for a 750 mL bottle of vanilla extract
C) $120 for a 1.2 L bottle of vanilla extract
D) $13.44 for a 112 mL bottle of vanilla extract

3. If it takes 3 men 8 hours to build a deck, how many hours would it take 5 men to build the same deck?
A) $2\frac{1}{5}$ hours
B) $4\frac{4}{5}$ hours
C) $13\frac{1}{3}$ hours
D) $1\frac{8}{15}$ hours

4. The ratio of apples to bananas in a fruit bowl is 4:3. If there are 12 apples in the fruitbowl, how many bananas are there?
A) 3
B) 4
C) 9
D) 36

5. If the cost of a 950 mL jar of mayonnaise is $5.35, what would you expect the cost of a 355 mL jar to be?
A) $0.50
B) $1.43
C) $1.99
D) $6.30

6. At the bookstore, all bestsellers are marked down by 20%. Luc then uses his 'Book Club' card which gives him a further 8% off the reduced price. What is the total percent discount Luc will get off the original price, if the bestseller book he is buying originally cost $19.99?
A) 28.0%
B) 26.4%
C) 12.0%
D) 35.8%

7.
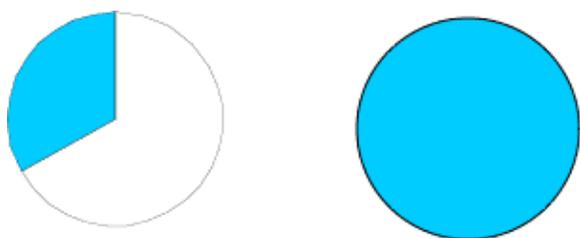
The blue shaded portions of the diagrams above, if combined, represent approximately:
A) 30%
B) 130%
C) 125%
D) 100%

8. Which of the options below is an expression equivalent to 100.25%?
A) 125%

B) $1\frac{1}{4}\%$

C) $100\frac{1}{4}\%$

D) $100\frac{1}{5}\%$

9. The grocery store has a deal on canned soup. If you buy one can, the cost per can is $1.65. If you buy a pack of 3 cans, the cost for the pack is $3.75. How much less does *each* can of soup cost if you buy them as a 3-pack?
A) $0.75
B) $1.25
C) $0.40
D) $1.20

10.

11.

School	Number of Teachers	Number of Students
Douglas Fir Junior High	12	900
Larch Junior High	16	1450
Aspen Junior High	21	1900
Scotch Pine Junior High	9	1200

Based on the above table, which school has the *least* number of students per teacher?
A) Scotch Pine Junior High
B) Aspen Junior High
C) Larch Junior High
D) Douglas Fir Junior High
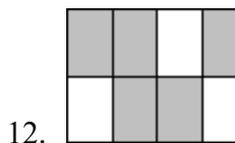
12.

If each tile represents 25%, then the total shaded area shown in the figure above represents:
A) 100%

B) 62.5%

C) $\frac{5}{8}$

D) 125%

13. Sasha empties her pool at the end of the summer. It takes 45 minutes when the pump empties the water at a rate of 900 L/min. The time is inversely proportional to the rate. Sasha buys a new pump that can remove the pool water at a rate of 1800 L/min. What time will this new pump take to empty the pool?
    A) 45 minutes
    B) 22.5 minutes
    C) 90 minutes
    D) 9 minutes

14. Which of the following items costs the most per unit price?
    A) $15 for a 250 mL bottle of vanilla extract
    B) $60 for a 750 mL bottle of vanilla extract
    C) $120 for a 1.2 L bottle of vanilla extract
    D) $13.44 for a 112 mL bottle of vanilla extract

15. If it takes 12 birds 13 hours to eat all the seed in a bird feeder, how many hours will a bird feeder full of seed last if only 5 birds are around to eat from the feeder?
    A) 26 hours
    B) 4.6 hours
    C) 31.2 hours
    D) 6 hours

16. A lawn sprinkler system is set up on an automatic timer to water the lawn for 10 minutes, turn off for 170 minutes, then repeat the cycle. When the water is flowing, it is pumped at the rate of 20 L/min. How many litres of water are used in one week? (Do not include the unit in your answer)

17. The grocery store has a deal on canned soup. If you buy one can, the cost per can is $1.65. If you buy a pack of 3 cans, the cost for the pack is $3.75. How much less does *each* can of soup cost if you buy them as a 3-pack?
   A) $0.75
    B) $1.25
    C) $0.40
    D) $1.20

18. At 4 P.M., a 1.2 m fencepost casts a shadow 140 cm long, and the neighbouring spruce tree casts a shadow 585 cm long. The height of the tree is
    A) 3.5 m
    B) 5.0 m
    C) 5.7 m
    D) 8.3 m

19.

> Jenn's digital camera takes pictures that measure 1024 × 768 pixels in size. To place the picture in the school newspaper, she needs to reduce each dimension by 75%.

If there are 30 pixels in 1 cm, then the final dimensions of the picture will be

A) 7.4 cm × 9.9 cm
B) 4.7 cm × 7.9 cm
C) 7.9 cm × 10.4 cm
D) 8.5 cm × 6.4 cm

20. Use the image below to determine the area of the shaded region. All the small triangles are equilateral.
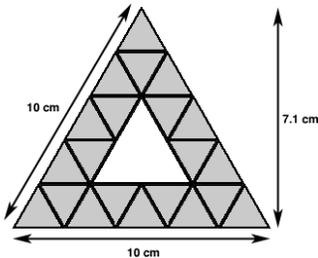
The area of the shaded region, to the nearest tenth, is _____ cm².

21. If it takes 3 men 8 hours to build a deck, how many hours would it take 5 men to build the same deck?

A) $2\frac{1}{5}$ hours

B) $4\frac{4}{5}$ hours

C) $13\frac{1}{3}$ hours

D) $1\frac{8}{15}$ hours

22. Which of the following items costs the most per unit price?
A) $15 for a 250 mL bottle of vanilla extract
B) $60 for a 750 mL bottle of vanilla extract
C) $120 for a 1.2 L bottle of vanilla extract
D) $13.44 for a 112 mL bottle of vanilla extract
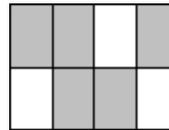
23. If each tile represents 25%, then the total shaded area shown in the figure above represents:
A) 100%

B) 62.5%

C) $\frac{5}{8}$

D) 125%

24. At a poultry farm, $\frac{1}{3}$ of the birds are turkeys, $\frac{1}{4}$ are chickens and the remainder are geese. If there are 180 chickens, how many geese are there?
A) 300
B) 240
C) 180
D) 720

25. Last year Vicky made $5.50 per hour at her summer job. This year her supervisor has given her a raise, and she will now make $8.25 per hour. What percentage increase is her new hourly wage above her old hourly wage?
    A) 150%
    B) 50%
    C) 75%
    D) 67%

26. Elizabeth has EXACTLY enough money to buy 12 apples and 8 oranges, or 10 apples and 11 oranges, without getting any change back. If she decides to just get oranges with her money, how many can she get?

27. Glenn and Jim have the same ratio of tomato plants to potato plants in their gardens. Glenn has 3 tomato plants for every 4 potato plants in his garden. If Jim has 49 plants in total in his garden, how many potato plants does he have?
    A) 7
    B) 21
    C) 28
    D) 12.5

28. Two cars leave the same restaurant at the same time, both headed north. One travels at 110 km/h and the other at 90 km/h. How long will it take before they are 40 km apart?
    A) 4 hours
    B) 0.2 hours
    C) 2 hours

D) 0.4 hours

29. At the bookstore, all bestsellers are marked down by 20%. Luc then uses his 'Book Club' card which gives him a further 8% off the reduced price. If the bestseller book Luc bought had an original price of $19.99. What did Luc pay for the book after all the price deductions were made?
    A) $14.71
    B) $15.99
    C) $14.39
    D) $18.39

30. It took Glenn 3 hours to drive from Calgary to Fairmont Hot Springs, a distance of 321 km. Given this information, at what rate was he traveling?
    A) 1.78 km/h
    B) 107 km/h
    C) 0.0093 km/h
    D) 963 km/h

31. Mrs. Smith's Grade 8 class of 31 students had an average mark of 76% on the math test. Mr. Jones' Grade 8 class of 24 students had an average of 68% on the same test. What was the average mark for Mrs. Smith's and Mr. Jones' classes combined?
    A) 72.5%
    B) 72.0%
    C) 74.0%
    D) 76.0%

32. Though computer monitors can display virtually any shade of colour visible to the eye, in fact they do so by controlling only three colours: red, green, and blue. By varying the amounts of red, green, and blue light, they can create the illusion of virtually any other colour.

    The colour seen here can be produced by combining 210 parts red, 180 parts green, and 120 parts blue. What is the simplest ratio of these colours?
    A) 210:180:120
    B) 21:18:12
    C) 7:6:4
    D) 1:0.86:0.57

33. The mixtures in Ruth's ice cream maker cooled at a rate of 3°C every 5 minutes for a total temperature change of –15°C. How long did it take to complete this temperature change?
    A) 25 minutes
    B) 5 minutes
    C) 3 minutes
    D) –5 minutes

34. At the bookstore, all bestsellers are marked down by 20%. Luc then uses his 'Book Club' card which gives him a further 8% off the reduced price. If the bestseller book Luc bought had an original price of $19.99. What did Luc pay for the book after all the price deductions were made?
    A) $14.71
    B) $15.99
    C) $14.39
    D) $18.39

35.

Jenn's digital camera takes pictures that measure 1024 × 768 pixels in size. To place the picture in the school newspaper, she needs to reduce each dimension by 75%.

If there are 30 pixels in 1 cm, then the final dimensions of the picture will be
    A) 7.4 cm × 9.9 cm
    B) 4.7 cm × 7.9 cm
    C) 7.9 cm × 10.4 cm
    D) 8.5 cm × 6.4 cm

36. Maurice has 2 sisters and 2 brothers, so the ratio of male to female children in his family is:
    A) 2:3
    B) 3:2
    C) 2:2
    D) 2:2:1

37. Two cars leave the same restaurant at the same time, one headed east at 110 km/h and the other headed west at 100 km/h. How long will it take before they are 525 km apart?
A) 5.25 hours
B) 2.5 hours
C) 52.5 hours
D) 5 hours

38. Mitch is making lemonade. His recipe calls for 1 part lemon juice, 2 parts sugar and 4 parts water. If he uses 3 cups of sugar, what amount of lemon juice and water does he need?
A) 1.5 cups lemon juice; 6 cups water
B) 1 cup lemon juice; 4 cups water
C) 3 cups lemon juice; 12 cups water
D) 2 cups lemon juice; 8 cups water

39. Elizabeth has EXACTLY enough money to buy 12 apples and 8 oranges, or 10 apples and 11 oranges, without getting any change back. If she decides to just get oranges with her money, how many can she get?

40. Speed calculated in kilometers per hours is a measurement of:
A) time
B) percent
C) distance
D) rate

41.

School	Number of Teachers	Number of Students
Douglas Fir Junior High	12	900
Larch Junior High	16	1450
Aspen Junior High	21	1900
Scotch Pine Junior High	9	1200

If Larch Junior High is hiring more teachers, how many more teachers will they need to hire to have a 60:1 student to teacher ratio?
A) 8
B) 24
C) 4
D) 6

Square Roots and the Pythagorean Theorem

1.   A community garden has an area of 400 square meters. The garden is divided into 16 individual congruent square plots. The side length of each plot is

A) 5
B) 10
C) 20
D) 25

2.   An army wishes to scale a castle wall that is 20 cubits high. The wall is on the other side of a moat that is 12 cubits wide. The army's ladder needs to be _____ cubits. (Keep in mind that the ladder must be able to reach the top of the wall, so round your answer up.)

A) 22
B) 23
C) 24
D) 25

3. The year 1936 had a square root that was a whole number. The next year that is a perfect square is 2025. Based on this information, a reasonable estimate for $\sqrt{2009}$ would be:

A) 44.2
B) 44.4
C) 44.6
D) 44.8

4.

Jennifer used exactly one whole can of paint on a square backdrop for the school play. The label on the can stated that one can would cover 34 square meters of wall surface.

To one decimal place, the best *estimate* of the side length of the backdrop would be:

A) 6.3
B) 5.9
C) 5.5
D) 5.1
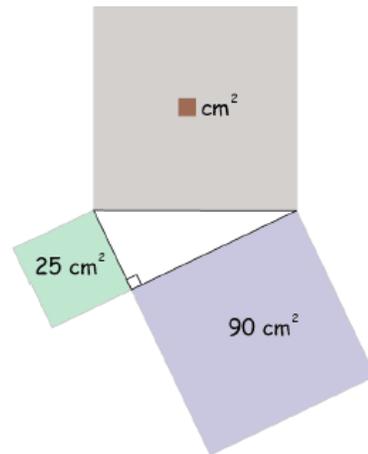
5.
The area of the unknown square (in square centimeters) is:

A) 8
B) 11
C) 65
D) 115
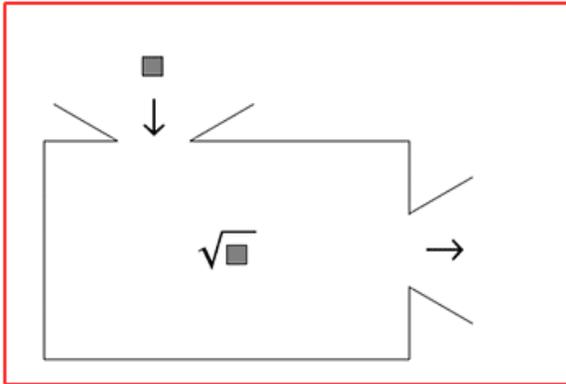
6.

The square root machine

A Grade 8 Math student made the above poster to help illustrate some of the ideas that had been discussed in class.

If ■ were replaced with 576, the output of the machine would be:

A) 12
B) 24
C) 288
D) 333776

7. In the triangle shown below, dimensions are in cm.
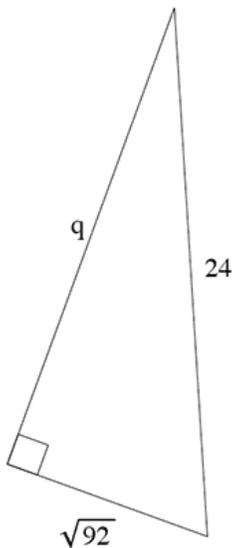
The length of side q is _____ cm.

A) 576
B) 25.8
C) 23.5

D) 22

8. The number which is a perfect square is

A) 10
B) 21
C) 50
D) 81

9. The coordinate grid shown was drawn on centimeter grid paper.
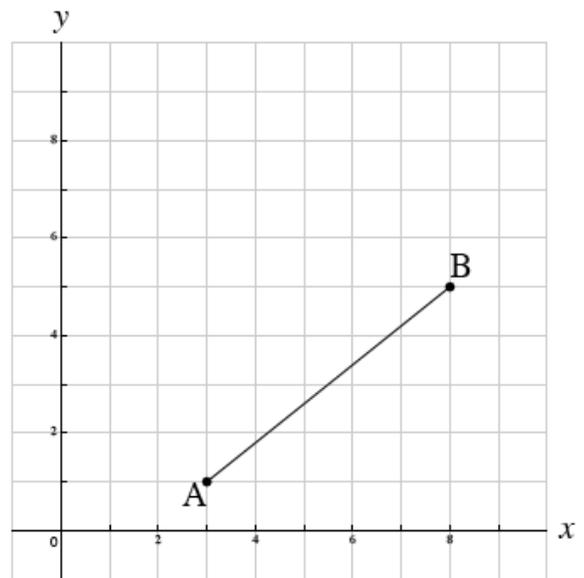
To the nearest tenth of a centimeter, the length of line segment AB is

A) 3.0
B) 5.4
C) 6.4
D) 7.2

10. If Z represents the value of $\sqrt{20}$, then

A) $Z < 4$
B) $4 < Z < 5$
C) $Z > 5$
D) None of the above

11. Calvin leans a 10 m ladder against a house. If the top of the ladder reaches 8 m up the side of the house, how far from the wall is the base of the ladder?

    A) 3
    B) 4
    C) 5
    D) 6

12. Michael used a calculator to find the square root of a number. He rounded to one decimal place and got an answer of 5.6

    The point on the number line indicating Michael's number is

    A) A
    B) B
    C) C
    D) D

13. A 3 m ladder is leaning against a wall with its base 2 m from the wall. How high up the wall does the ladder reach?

    A) 1.2 m
    B) 2.0 m
    C) 2.2 m
    D) 2.4 m

14. The false statement below is:

    A) A perfect square can end in 1
    B) A perfect square has an odd number of factors
    C) A perfect square is always formed when you multiply a number by itself

D) A perfect square can end in 3

15. A student was working with some very large numbers and wanted to calculate

    $$\sqrt{10\,000\,200\,001}$$

    but the number was too big to find the square root using a calculator. The teacher gave the student a hint, revealing that ALL the factors of the number were in the list:
    {1, 11, 121, 9091, 100001, 1100011, 82646281, 909109091, 10000200001}
    Based on this list, the student was almost instantly able to identify the square root.
    The actual value of

    $$\sqrt{10\,000\,200\,001}$$ is:

    A) 9091
    B) 100001
    C) 1100011
    D) 82646281

Triangle	Side lengths (cm)
A	9, 12, 14
B	7, 8, 11
C	10, 11, 14
D	7, 24, 25

16.

    The right triangle above is:

    A) A
    B) B
    C) C
    D) D

17. A community garden has an area of 400 square meters. The garden is divided into 16 individual congruent square plots.
The side length of each plot is
A) 5
B) 10
C) 20
D) 25

18. A crime scene investigator must tape off a square space with an area of 152 m². The barrier of yellow tape is needed all around the outside edges of the square to protect the scene and evidence contained within from curious passersby.
The approximate length of tape needed (in meters) for this is:
A) 50
B) 52
C) 54
D) 56

19. Without using a calculator, the approximate square root of 52 is
A) 6.6
B) 7.3
C) 7.8
D) 8.2

20. The number of perfect squares greater than 900 and less than 1200 is:
A) 4

B) 5
C) 6
D) 7

21. Find the value of x:
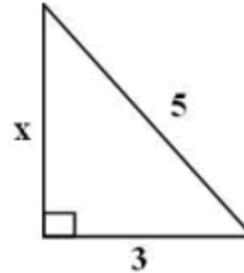

A) 3
B) 4
C) 5
D) 6

22. The false statement below is:
A) A perfect square can end in 1
B) A perfect square has an odd number of factors
C) A perfect square is always formed when you multiply a number by itself
D) A perfect square can end in 3

23. Find the value of x:
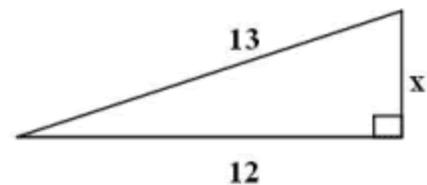
A) 3
B) 4
C) 5
D) 6

24.

A 3.5 m long ladder is being used for a junior high school production of Julio and Romiet. The bottom of the ladder will be placed 1.1 m from the base of Romiet's house. The window sill is 3.4 m from the ground.

The top of the ladder will end up:
A) below the level of the sill
B) at the level of the sill
C) above the level of the sill
D) not reaching the house

25.
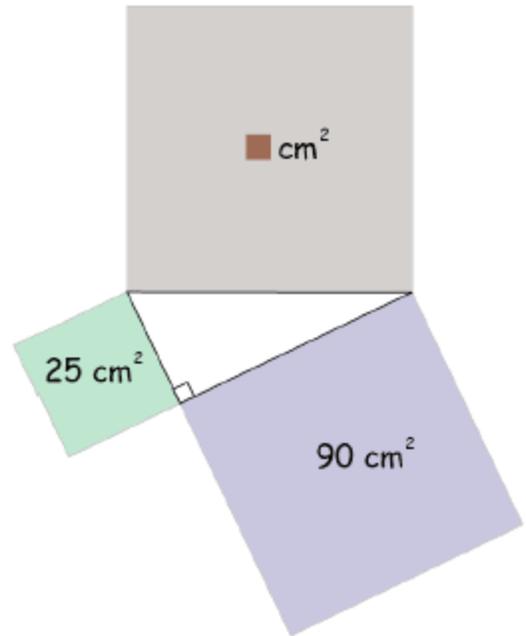
The area of the unknown square (in square centimeters) is:
A) 8
B) 11
C) 65
D) 115

26. Michael used a calculator to find the square root of a number. He rounded to one decimal place and got an answer of 5.6


The point on the number line indicating Michael's number is
A) A
B) B
C) C
D) D

27. Fred says that his age is: 'Eight squared, less half the square root of sixteen.' How old is Fred?
    A) 62 years
    B) 64 years
    C) 60 years
    D) 61.2 years

28. The coordinate grid shown was drawn on centimeter grid paper.
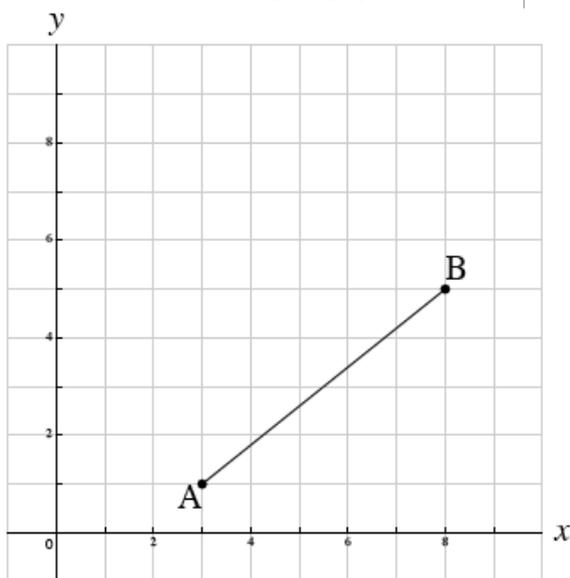
    To the nearest tenth of a centimeter, the length of line segment AB is
    A) 3.0
   B) 5.4
    C) 6.4
    D) 7.2

29. The number 42 lies between two consecutive square numbers. What is the sum of these two numbers?
    A) 13
    B) 61
    C) 85
    D) 100

30. Kathy's son is the square root of her age plus 2 years. If Kathy's son is 8 years old, how old is Kathy?
    A) 64 years
    B) 36 years
    C) 16 years
    D) 38 years

31. In the triangle shown below, the measurements have units in cm.
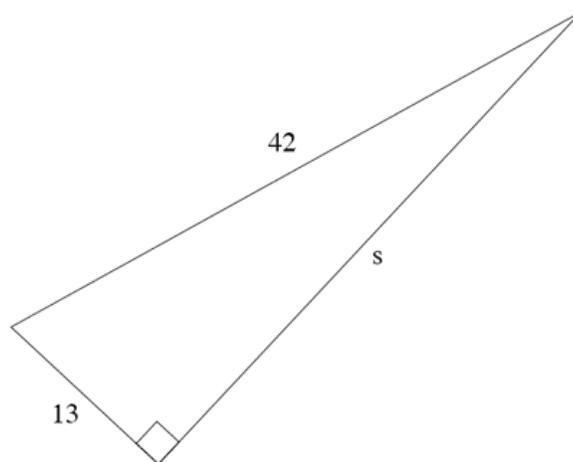
    The length of side s, to one decimal place is _____ cm.
    A) 39.9
    B) 41.4
    C) 41.9
    D) 44.0

32. The square root machine

    A Grade 8 Math student made the above poster to help illustrate some of the ideas that had been discussed in class.

    If ■ were replaced with 576, the output of the machine would be:
    A) 12
    B) 24
    C) 288
    D) 333776

33. The value of $\sqrt{89}$ is closest to which whole number?
    A) 7
    B) 8
    C) 9
    D) 10

34. If Z represents the value of $\sqrt{20}$, then
    A) $Z < 4$
    B) $4 < Z < 5$
    C) $Z > 5$
    D) None of the above

35.

A crime scene investigator must tape off a square space with an area of 152
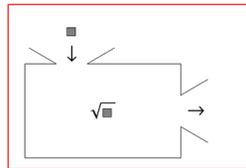
m². The barrier of yellow tape is needed all around the outside edges of the square to protect the scene and evidence contained within from curious passersby.

The approximate length of tape needed (in meters) for this is:
    A) 50
    B) 52
    C) 54
    D) 56

36. The number 42 lies between two consecutive square numbers. What is the sum of these two numbers?
    A) 13
    B) 61
    C) 85
    D) 100

37. A student was working with some very large numbers and wanted to calculate

$$\sqrt{10\,000\,200\,001}$$

but the number was too big to find the square root using a calculator. The teacher gave the student a hint, revealing that ALL the factors of the number were in the list:
{1, 11, 121, 9091, 100001, 1100011, 82646281, 909109091, 10000200001}
Based on this list, the student was almost instantly able to identify the square root.
The actual value of

$\sqrt{10\,000\,200\,001}$ is:

    A) 9091
    B) 100001
    C) 1100011
    D) 82646281

38.
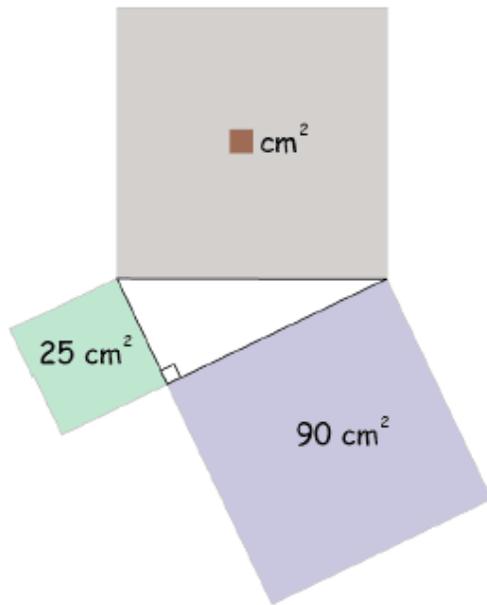
The area of the unknown square (in square centimeters) is:

A) 8
B) 11
C) 65
D) 115

A) A
B) B
C) C
D) D

39. Calvin leans a 10 m ladder against a house. If the top of the ladder reaches 8 m up the side of the house, how far from the wall is the base of the ladder?

A) 3
B) 4
C) 5
D) 6

40. Ashley used a calculator to find the square root of 47.
Which point, on the line below, shows the correct placement of the solution?

Answer Key

Data Analysis and Probability

1. C
2. B
3. 12
4. C
5. C
6. D
7. A
8. B
9. A
10. A
11. B
12. D
13. A
14. 12.5
15. A
16. B
17. B
18. C
19. D
20. B
21. B
22. D
23. D
24. C
25. A
26. C
27. A
28. D
29. B
30. B
31. B
32. C
33. B
34. A
35. A
36. A
37. B
38. B

39. 4
40. 12.5

Geometry

1. A
2. B
3. 60 degrees
4. B
5. 18
6. C
7. D
8. A
9. D
10. B
11. A
12. B
13. D
14. C
15. 11
16. C
17. A
18. D
19. D
20. D
21. A
22. C
23. A
24. D
25. C
26. D
27. B
28. C
29. 12
30. D
31. B
32. D
33. 120 degrees
34. C
35. B
36. B

37. D
38. D
39. D
40. D

36. B
37. B
38. C
39. C
40. A

Integers

1. D
2. B
3. D
4. C
5. A
6. D
7. B
8. C
9. C
10. B
11. A
12. C
13. C
14. C
15. B
16. C
17. A
18. C
19. C
20. D
21. A
22. B
23. A
24. A
25. C
26. D
27. C
28. A
29. B
30. D
31. C
32. A
33. C
34. B
35. C

Linear Equations and Graphing

1. B
2. B
3. C
4. C
5. C
6. A
7. D
8. D
9. A
10. C
11. D
12. D
13. B
14. B
15. C
16. A
17. C
18. D
19. C
20. D
21. A
22. A
23. B
24. A
25. D
26. C
27. C
28. D
29. C
30. C
31. C
32. A
33. B
34. A
35. D

36. D
37. B
38. D
39. C
40. C

Measuring Prisms and Cylinders

1. 602.88
2. A
3. A
4. C
5. D
6. C
7. D
8. B
9. B
10. D
11. D
12. 251
13. A
14. D
15. B
16. A
17. A
18. A
19. C
20. 7065
21. 539
22. A
23. B
24. C
25. C
26. 602.88
27. B
28. B
29. 424
30. B
31. A
32. D
33. D
34. 282.6

35. B
36. 0.08
37. C
38. D
39. C
40. B

Operations With Fractions

1. C
2. B
3. C
4. C
5. C
6. D
7. D
8. C
9. D
10. B
11. A
12. C
13. C
14. B
15. C
16. D
17. A
18. D
19. C
20. B
21. B
22. B
23. C
24. B
25. B
26. D
27. D
28. A
29. C
30. D
31. C
32. D
33. C

34. A
35. C
36. A
37. B
38. B
39. A
40. B

Percent, Ratio and Rate

1. B
2. D
3. B
4. C
5. C
6. B
7. B
8. C
9. C
10. D
11. D
12. B
13. D
14. C
15. 11200
16. C
17. B
18. D
19. 29.8
20. B
21. D
22. D
23. A
24. B
25. 26
26. C
27. C
28. A
29. B
30. A
31. C
32. A
33. A

34. D
35. B
36. B
37. A
38. 26
39. D
40. A

Square Roots and the Pythagorean Theorem

1. A
2. C
3. D
4. B
5. D
6. B
7. D
8. D
9. C
10. B
11. D
12. C
13. C
14. D
15. B
16. D
17. A
18. A
19. B
20. A
21. B
22. D
23. C
24. A
25. D
26. C
27. A
28. C
29. C
30. B
31. A

32. B
33. C
34. B
35. A
36. C
37. B
38. D
39. D
40. B