AIMS Grade 4 Mathematics Sample Test and Think-Throughs

FOR STUDENTS

GRADE 4
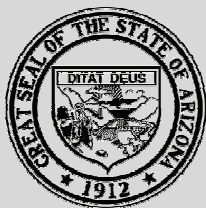
Arizona Department of Education
John Huppenthal, Superintendent of Public Instruction

Introduction

Dear Students,

This AIMS sample test is meant to give you experience in taking AIMS. The samples are not supposed to be a practice test. They give you a sample of the kinds of questions that you can find on AIMS. The best way to make sure you can Meet and Exceed on AIMS is to *be in class*, *be prepared*, and *be on time to class* each day. Learning in class and through homework is the way to meet your goals on AIMS.

Sometimes students get nervous when taking tests. They may need some help with test-taking strategies. In this document, you can take an AIMS sample test for mathematics. You will see that some of the items have explanations of how to solve the problems. This will help you think through the questions, just like you do in class. There are also more problems like the ones explained, so you can try them on your own or with your teacher.

When you look at the sample problems that show the solution process, you will also see listed on the answer key the Strand, Concept, and Performance Objective that is being measured. This is listed so you can see how it connects to the lessons your teacher creates from the AZ Academic Standards. Read through the samples and see how your thoughts and answers compare.

Good luck and have fun!

Teachers – Please help your students understand the following important facts.

- The AIMS Mathematics Sample Tests follow the AIMS mathematics blueprints for the 2008 Mathematics Academic Standards, but only represent half the number of items that are on the actual AIMS 3-8 and AIMS HS assessments.
- The best way to study for AIMS is to be sure students know and are able to do the grade-level performance objectives in each content area tested. Your lessons based on all of these grade-level mathematics standards are the best way that students gain necessary knowledge.
- The activities contained in this document will give experience in taking AIMS. It is not a practice test. Students should practice by doing homework.
- Students should work through the sample test as if it is the AIMS – don't allow them to use a calculator or any other support materials.

Mathematics Sample Test

Grade 4

Directions: Read each problem and select the best answer.

1 Johnny used the rule "double the number" to create the pattern below.

3, 6, 12, 24, …

Which pair of numbers is part of the pattern?

A   36, 72

B   48, 72

C   96, 144

D   96, 192

2 Jay arranged 48 books into 4 equal piles to help him find the quotient of 48 ÷ 4. How can Jay use this method to find the quotient of 189 ÷ 9?

A   Put 189 books into 4 equal piles.

B   Put 189 books into 9 equal piles.

C   Add 189 to 48 books. Put them into 4 piles.

D   Add 189 to 48 books. Put them into 9 piles.

3 Martha is going to make bracelets to sell for a fundraiser. She bought 8 meters of yarn. She wants to cut it into pieces that are 16 centimeters long for each bracelet. How many bracelets can Martha make?

A   2

B   6

C   50

D   128

4 The table below shows the number of baseball cards Tika collected during four months.

Tika's Baseball Cards

Month	Cards Collected
March	145
April	99
May	212
June	187

What is the **best** estimate for the number of baseball cards Tika collected in all?

A   between 400 and 500

B   between 500 and 600

C   between 600 and 700

D   between 700 and 800

5 Which number has the same value as 0.14?

A   0.14%

B   1.40%

C   14.0%

D   140.0%

Go On▶

6 Look at the calendar below.

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

What **best** describes the dates that are on Saturdays?

A multiples of 2

B multiples of 3

C multiples of 4

D multiples of 7

7 Stacey used cutouts of two triangles to make the figures below.
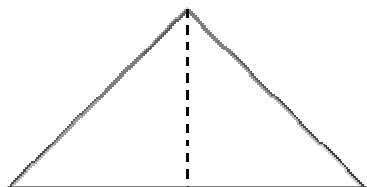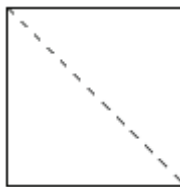
Figure 1   Figure 2

Which statement is true about the figures?

A Both figures have the same area.

B Both figures have the same perimeter.

C Both figures have the same number of sides.

D Both figures have the same number of vertices.

8 Randy creates a pattern using the rule "divide by 3." Which pattern uses Randy's rule?

A 120, 90, 60, 30

B 342, 114, 38, 12

C 366, 180, 33, 6

D 540, 180, 60, 20

Go On▶

9 Mary used some of the eggs from the carton below to make breakfast.
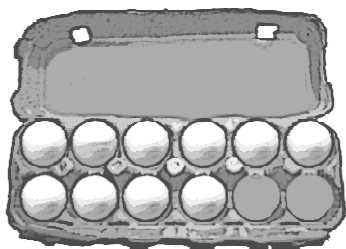
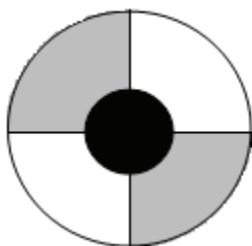What portion of the eggs did Mary use to make breakfast?
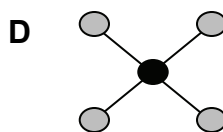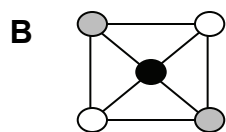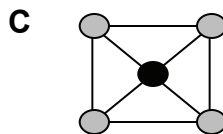
A $\dfrac{2}{12}$

B $\dfrac{2}{10}$

C $\dfrac{2}{6}$

D $\dfrac{10}{12}$

10 Look at the map below.

Which vertex-edge graph represents this map?

A   **C**

B   **D**
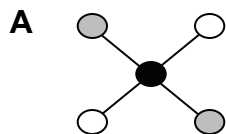
Go On▶

11 Juan wants to solve the problem shown below.

$$27 - 21 \div 3$$

Which step should Juan do first?

A $21 \div 3$

B $27 \div 3$

C $27 - 3$

D $27 - 21$

12 John has 10 pairs of white socks and 1 pair of blue socks in his drawer. There are no other socks in the drawer. Without looking, he takes 1 pair out of the drawer. What are his chances of choosing a white pair of socks?

A certain

B impossible

C likely

D unlikely

13 Nicki's class needs to raise $89.45 in order to have a pizza party. So far, she has collected $62.90. How much more money does Nicki's class need to buy the pizza party?

A $17.45

B $26.55

C $27.55

D $152.35

14 Look at the number pattern.

972, 324, 108, 36, …

If the pattern continues, what will be the 6th number in the pattern?

A 3

B 4

C 9

D 12

15 Mike left school at 3:40 p.m. He arrived at home at the time shown on the clock below.

How long did it take Mike to get home from school?

A 20 minutes

B 25 minutes

C 30 minutes

D 35 minutes

16 What is the solution to the equation?

$$\frac{3}{5} - \frac{2}{5} =$$

A 0

B $\frac{1}{5}$

C 1

D $\frac{5}{5}$

Go On▶

17 On Monday, Joel had 17 treats to give his puppy. He gives his puppy 2 or 3 treats each day. The table below shows the number of treats Joel has left at the end of each day.

Puppy Treats

Day	Number of Treats Left
Monday	15
Tuesday	12
Wednesday	10
Thursday	7

Based on the information in the table, which prediction will **most** likely happen if Joel continues to give his puppy 2 or 3 treats each day?

A Joel may only have 1 treat left to give his puppy on Sunday.

B Joel will not have any treats to give his puppy on Sunday.

C Joel will have 7 treats to give his puppy on Sunday.

D Joel may have 4 treats left on Saturday night.

18 Jim has $7.00 that he uses to purchase school lunch. He spends the same amount of money each day. Which expression can be used to show how much Jim can spend on lunch each day?

A $7 + d$

B $7 - d$

C $7 \times d$

D $7 \div d$

19 Look at the diagram of Laura's yard.
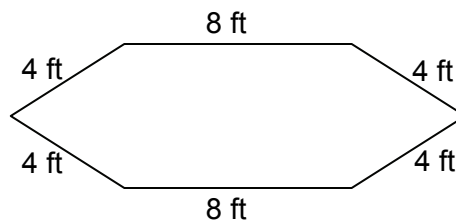
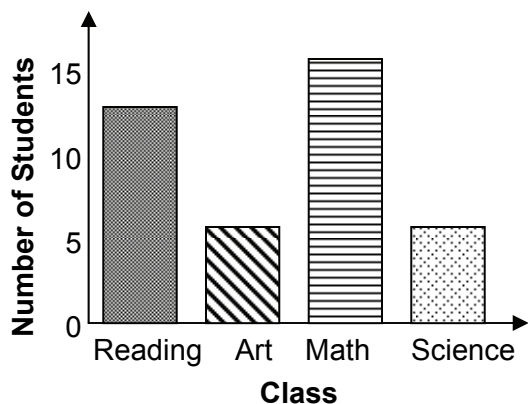Which expression can Laura use to find the perimeter of her yard?

A $(4 \times 4) + (2 \times 8)$

B $(4 \times 8) + (2 \times 8)$

C $(4 + 4) + (2 + 8)$

D $(4 \times 8) + (2 \times 4)$

20 Look at the coordinate plane.
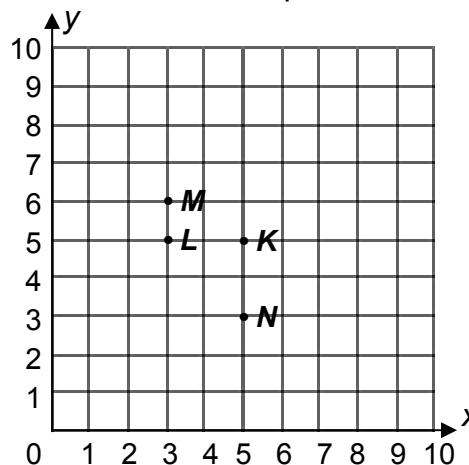
Which point is located at (3, 5)?

A K

B L

C M

D N

Go On▶

21 Anna asked her class which subject they liked best. She graphed the results.

Based on the graph, which statement is true?

A More students like Math than Science.

B Reading and Math are liked the same.

C More students like Science than Art.

D Reading is liked best by all students.

22 The rule for finding the cost of any number of tickets (t) is multiply t by \$4. How many tickets will \$20 buy?

A 3 tickets

B 4 tickets

C 5 tickets

D 6 tickets

23 Which list shows all factors of 72?

A 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

B 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

C 1, 2, 3, 4, 8, 9, 18, 24, 36, 72

D 2, 3, 4, 6, 8, 9, 12, 18, 24, 36

24 Look at the figure.
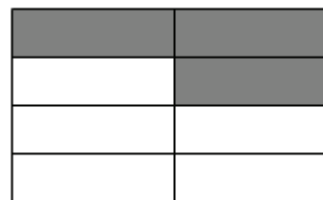
Which fraction represents the shaded part of the figure?

A $\dfrac{3}{8}$

B $\dfrac{3}{5}$

C $\dfrac{5}{8}$

D $\dfrac{5}{3}$

25 Lizeth is having a birthday party. She invited 19 people. She will buy enough juice boxes so each person can have at least 1. If the juice boxes come in packs of 6, how many packs should Lizeth buy?

A 1

B 2

C 3

D 4

26 Which expression will **not** solve 59 X 20?

A (50 X 20) + (9 X 20)

B (59 X 10) + (59 X 10)

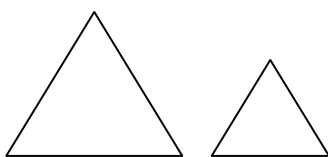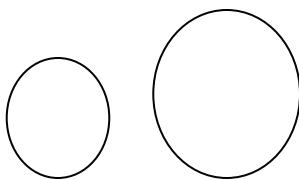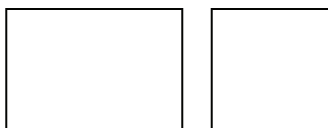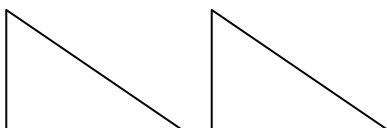**C** (59 X 10) + (1 X 20)

D (60 X 20) − (1 X 20)

Go On▶

27 Marcus bought a pet frog. He went to a pet store to buy some supplies for the frog's home. He found a list of frog rules in the pet store.

- Small sized frogs need to live in a 10 gallon tank.
- All frogs need warm light or sunshine.
- All frogs need water to keep their skin moist.
- Frogs eat 5 bugs and worms per day.

What information should the pet store owner ask Marcus before he sells him the supplies?

A How big is your frog?

B What is your frog's name?

C When did you get your frog?
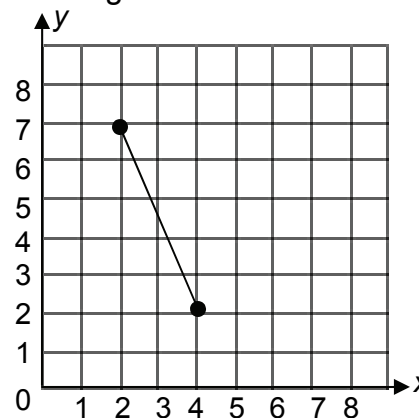
D Do you like bugs and worms?

28 Which pair of figures appears to be congruent?

A

B

C

D

29 Dylan had a whole cupcake in his lunch bag. He ate only $\frac{1}{4}$ of his cupcake. How much of the cupcake does he have left?

A $\frac{1}{4}$

B $\frac{1}{2}$

C $\frac{1}{3}$

D $\frac{3}{4}$

30 What are the coordinates of the endpoints of the line segment?

A (7, 4) and (2, 4)

B (2, 7) and (4, 2)

C (2, 4) and (7, 2)

D (4, 2) and (7, 2)

31 Which list is in order from **greatest** to **least**?

A 0.87, 0.75, 1.25, 0.15

B 1.20, 1.00, 0.91, 0.95

C 1.52, 1.05, 0.84, 0.06

D 0.08, 0.79, 1.02, 1.19

Go On▶

32 Sandy solved the problem below in her math class.

$$\begin{array}{r} 78 \\ \times\ 15 \\ \hline 390 \\ +\ 780 \\ \hline 1170 \end{array}$$

What is another way that Sandy could solve the problem?

A Sandy can determine 78 X 10, then add that to 78 X 5.

B Sandy can determine 70 X 10, then add that to 8 X 5.

C Sandy can determine 78 X 10, then add that to 5 X 10.

D Sandy can determine 70 X 10, then add that to 15 X 10.

33 Look at the data set.

51, 35, 28, 49, 28, 46, 29

What is the median of the data set?

A 23

B 28

C 35

D 38

34 What is the solution to the equation?

3 X 10 + (9 X 2) =

A 48

B 78

C 84

D 114

AIMS Grade 4 Mathematics Think-Throughs & Practice Applications

The problems on the next few pages are from the sample test you just finished. They have been worked out for you to show the thought process behind finding the answers.

As you go through them, see how your thoughts compare to the ones given. Not every problem from the sample test will be shown in this same way.

The number for each problem matches the same number that is in the sample test. This way, if you got the problem incorrect, you can compare your answers and go back to see what you may have done differently.

Then, after each Think-Through problem, you will see two more problems. You can apply what you just learned from the Think-Through problems. These will be very similar to the Think-Through problem. They are also testing the same academic performance objective. This will give you even more practice to think through your own problem-solving process.

As you read through the solution process of the problems, you may notice that some of the words are *italicized*. This means that it is a mathematics term that would be helpful to know.

After the two extra problems, there will be a Summary Statement which explains what the problems are testing. Your teacher can use this to help you understand what each problem is testing. It will help you both to understand which concepts you may need more work on or which concepts you may have mastered.

3 Martha is going to make bracelets to sell for a fundraiser. She bought 8 meters of yarn. She wants to cut it into pieces that are 16 centimeters long for each bracelet. How many bracelets can Martha make?

    A   2

    B   6

    C   50

    D   128

This problem is asking me to figure out how many bracelets Martha can make. It tells me that she has 8 meters of yarn. And it tells me that each bracelet uses 16 centimeters of yarn. It looks like I am working with two different units of measure – meters and centimeters. So, the first thing I have to do is use the same unit.

Since the problem wants to know how many bracelets can be made, and each bracelet is 16 centimeters, I will convert everything into centimeters.

I know that in 1 meter, there are 100 centimeters. But, I need to know out how many centimeters are in 8 meters.

$$1 \text{ m} = 100 \text{ cm}$$

So, if 1 meter is equal to 100 centimeters, then 8 meters must be equal to 800 centimeters. I multiplied 100 by 8.

$$1 \text{ m} = 100 \text{ cm}$$
$$\times 8 \qquad \times 8$$
$$8 \text{ m} = 800 \text{ cm}$$

Now that I know Martha has 800 centimeters of yarn, I can figure out how many bracelets she can make.

The problem says each bracelet is 16 centimeters. She has 800 centimeters total. So, I have to take 800 and divide it by 16 to see how many bracelets can be made.

$$
\begin{array}{r}
\overline{50} \\
16\overline{)800} \\
-\underline{80} \\
00 \\
-\underline{0} \\
0
\end{array}
$$

800 divided by 16 is 50. This means that Martha can make 50 bracelets from the yarn that she has. This is answer choice **C**.

3a   Donna is buying ribbon to decorate her shoes. She buys 10 meters of ribbon. Each shoe needs 10 centimeters of ribbon. How many pairs of shoes can she decorate?

  A   25

  B   50

  C   100

  D   200

3b   Valley View Hospital received a shipment of flu shots. The total shipment is 1 liter. Each flu shot is 5 milliliters. How many shots can the hospital provide?

  A   20

  B   100

  C   200

  D   500

Summary Statement:

These problems include solving problems with conversions within the same measurement system.

4   The table below shows the number of baseball cards Tika collected during four months.

Tika's Baseball Cards

Month	Cards Collected
March	145
April	99
May	212
June	187

What is the **best** estimate for the number of baseball cards Tika collected in all?

A   between 400 and 500

B   between 500 and 600

C   between 600 and 700

D   between 700 and 800

I have to find out the total number of baseball cards collected. But, the question wants an *estimate*. This means I don't have to add up each exact number that is given.

I will round each number given. That will help me to get an *estimate* of the total number.

Tika's Baseball Cards

Month	Cards Collected	
March	145	→ about 150
April	99	→ about 100
May	212	→ about 200
June	187	→ about 200

$$+ \underline{}$$

650

Then, I can add up each *estimate* I made.

I have estimated that Tika has about 650 cards. When I look at the answer choices, I see that I need to find a range. I estimated that she has 650 baseball cards, which is between 600 and 700. This is answer choice **C**.

4a The table below shows the number of marbles that Matthew collected over four months.

Matthew's Marble Collection

Month	Marbles Collected
September	1,509
October	897
November	2,123
December	1,247

What is the best estimate of the total number of marbles that Matthew collected in four months?

A   between 3,000 and 4,000

B   between 4,000 and 5,000

C   between 5,000 and 6,000

D   between 6,000 and 7,000

4b Janet and her friends are baking cookies for a school fundraiser. The recipe they are using states they need to use $\frac{3}{4}$ cups of sugar for every 3 dozen cookies they make. If they make 7 dozen cookies, about how much sugar will they need to have?

A   approximately 1 cup

B   approximately 2 cups

C   approximately 4 cups

D   approximately 7 cups

Summary Statement:
These problems involve making estimates appropriate to a given situation or computation with whole numbers and fractions.

7   Stacey used cutouts of two triangles to make the figures below.
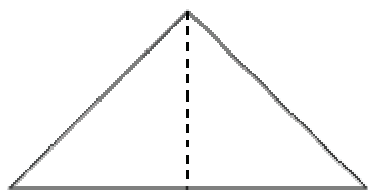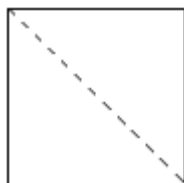
Figure 1   Figure 2

Which statement is true about the figures?

A   Both figures have the same area.

B   Both figures have the same perimeter.

C   Both figures have the same number of sides.

D   Both figures have the same number of vertices.

In this problem, I need to decide which statement from the answer choices is true. So, I will look at each answer choice and compare them to the figures.

A   **Both figures have the same area.**
This looks like it could be true. The area for each figure is the number of units inside the shapes. Since Figure 2 was created from the same triangles as Figure 1, the area has not changed. So, **this statement is true**. To be sure, I will check the other choices.
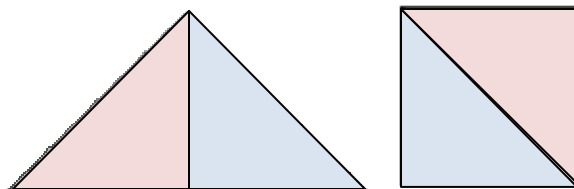
B   **Both figures have the same perimeter.**
If this were true, the distance around one figure has to be the same as the distance around the other figure. When I look at them, I see this is not true. The perimeter of the square is less than the perimeter of the triangle. This statement is **not** true.
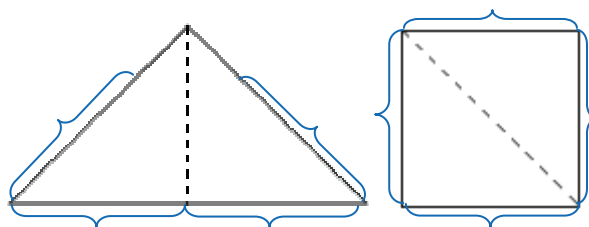
C   **Both figures have the same number of sides.**
Figure 1 is a triangle, which has 3 sides. Figure 2 is a square, which has four sides.
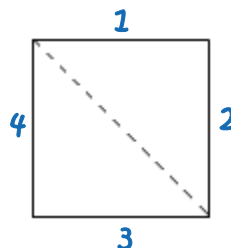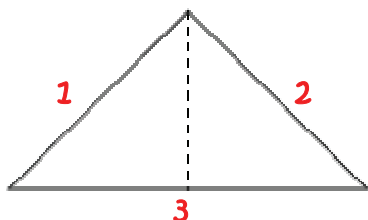
Therefore, this statement is definitely **not** true.

D   Both figures have the same number of vertices.
I remember the vertices are the points where the edges come together.
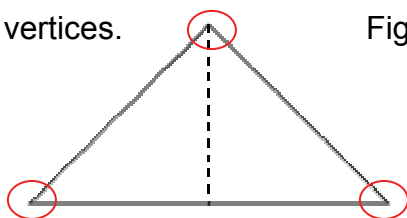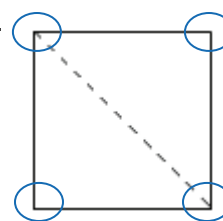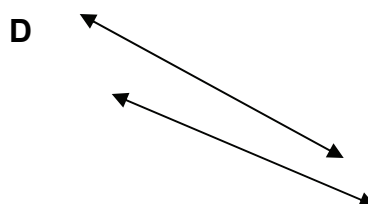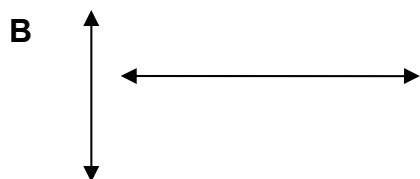
Figure 1 has 3 vertices.   Figure 2 has 4 vertices.

This statement is **not** true since they have a different number of vertices.

Looking back at all of my thoughts, it turns out I was right and answer choice **A** is the true statement. Both figures have the same area.

**7a**   Which figure shows two lines that appear to be parallel?

A

C

B

D
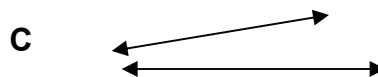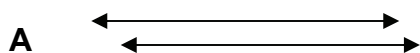
7b   Which figure below appears to have exactly two perpendicular sides?
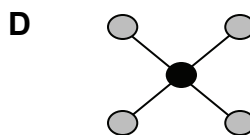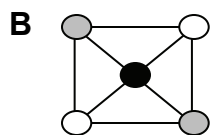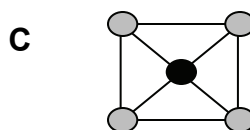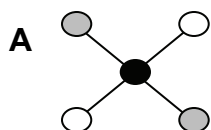
A

C

B

D
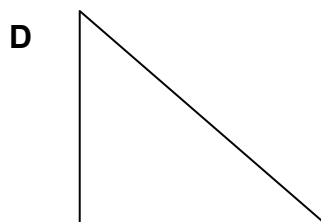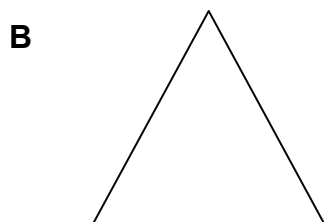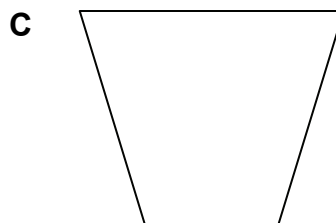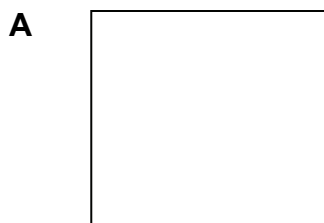
Summary Statement:
These problems involve students drawing and describing the relationships between points, lines, line segments, rays, and angles, including parallelism and perpendicularity.

10 Look at the map below.

Which vertex-edge graph represents this map?

A

C

B

D
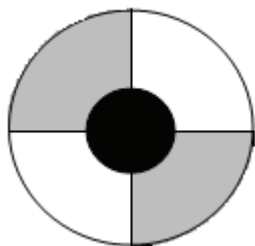
I have to figure out which of the *vertex-edge graphs* matches the map in the problem.

I remember that a *vertex-edge graph* is a graph that includes edges (or sides) and *vertices*. The *vertices* are the points where the edges meet. I will take the picture in the problem and figure out how it can be changed into a *vertex-edge graph*.

First, when I look at the picture, I notice that there are 5 different regions. Each one of these regions represents a *vertex*. That means when I am making this into a *vertex-edge graph*, each region will be represented by a *vertex*.
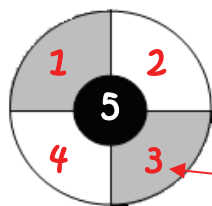
So, the *vertex edge-graph* has 5 *vertices*.

The next thing I look for is to see which regions share an edge. The number of edges that a region shares with another region is how I can figure out where to place the edges on my *vertex-edge graph*.

I count those and I get 8 edges.
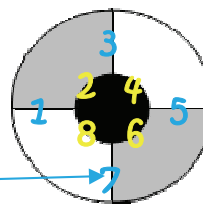
In the picture, I count 5 regions, which is 5 *vertices*.
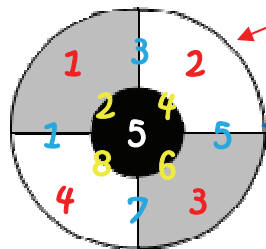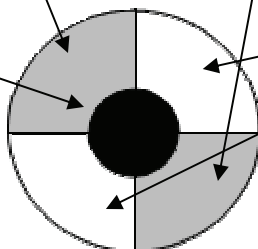

I count 8 shared edges in the image.

The last thing that I need to remember is the coloring of the picture. In the map picture, I see that the center is black. And I see that two regions are gray, and two regions are white.

This is important for me to remember when I am matching the picture to the *vertex-edge graph*.

The *vertex-edge* graph that represents the picture has 5 *vertices* and 8 edges. Also, the center *vertex* is black, the top left and bottom right *vertices* are gray, and the top right and bottom left *vertices* are white.
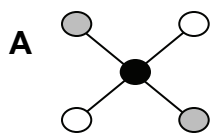
A Answer choice A has 5 vertices, and only 4 edges. And the vertices are the correct colors.
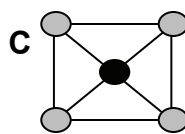
C Answer choice C has 5 vertices, and 8 edges, but the vertices are the wrong color.
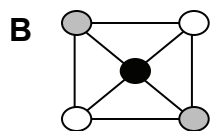
B Answer choice B has 5 vertices, and 8 edges and all vertices are the correct colors.
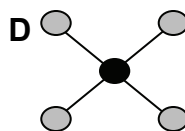
D Answer choice D has 5 vertices, and only 4 edges. And, the vertices are the wrong color.

So, when I compare what I counted in the image to the answer choices, I see that the only *vertex-edge graph* that has the same number of *vertices* and shared edges is answer choice ***B***.

10a Which vertex-edge graph represents the picture below?

A

C

B

D
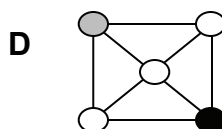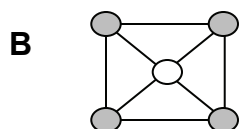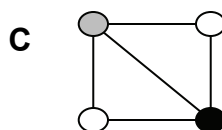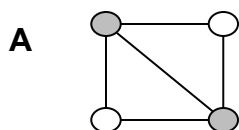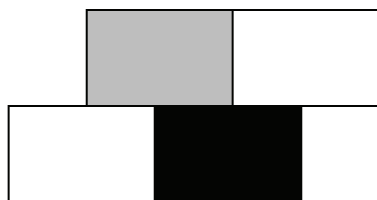
10b Which map does the vertex-edge graph represent?

A

C

B

D
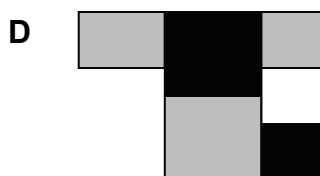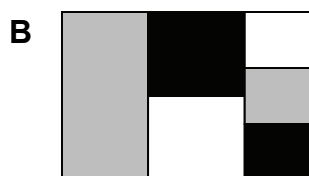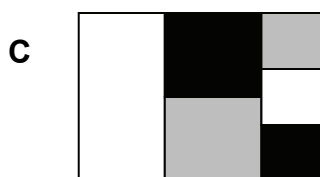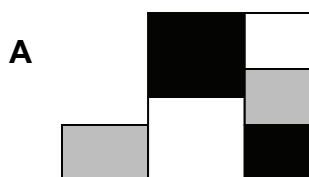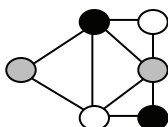
Summary Statement:
These problems involve students demonstrating the connection between map coloring and vertex coloring.

17 On Monday, Joel had 17 treats to give his puppy. He gives his puppy 2 or 3 treats each day. The table below shows the number of treats Joel has left at the end of each day.

Puppy Treats

Day	Number of Treats Left
Monday	15
Tuesday	12
Wednesday	10
Thursday	7

Based on the information in the table, which prediction will **most** likely happen if Joel continues to give his puppy 2 or 3 treats each day?

A Joel may only have 1 treat left to give his puppy on Sunday.

B Joel will not have any treats to give his puppy on Sunday.

C Joel will have 7 treats to give his puppy on Sunday.

D Joel may have 4 treats left on Saturday night.

What does this question want me to do? I need to predict which answer choice would be the most likely to happen. So, I will go through each answer choice and figure them out.

A Joel may only have 1 treat left to give his puppy on Sunday.
In order to know if this could be true, I have to take the information from the table and figure out how many treats Joel will have every day until Sunday.

Puppy Treats

Day	Number of Treats Left
Monday	15
Tuesday	12
Wednesday	10
Thursday	7

On Monday, he gave his puppy 2 treats, because he started with 17 and ended with 15. 17 – 15 = 2.

On Tuesday, he gave his puppy 3 treats, because he started with 15 and ended with 12. 15 – 12 = 3.

On Wednesday, he gave his puppy 2 treats, because he started with 12 and ended with 10. 12 – 10 = 2.

On Thursday, he gave his puppy 3 treats, because he started with 10 and ended with 7. 10 – 7 = 3.

Puppy Treats

Day	Number of Treats Left
Monday	15
Tuesday	12
Wednesday	10
Thursday	7
Friday	4
Saturday	1
Sunday	0

For the rest of the days that are not included in the table, I will predict that Joel gives his puppy 3 treats each day. I will do this so I know what would be the least amount of treats he could have left.

On Friday, if he gives his puppy 3 treats, he will have 4 left because he started with 7. 7 – 3 = 4.

On Saturday, if he gives his puppy 3 treats, he will have 1 left because he started with 4. 4 – 3 = 1.

This means, that if Joel gives his puppy 3 treats each day until Sunday, he will only have 1 treat left to give him on Sunday.

So, answer choice A could happen.

B   Joel will not have any treats to give his puppy on Sunday.
This statement most likely will not happen. I just figured out that if Joel gives his puppy the most number of treats per day, then he will have at least 1 left for him on Sunday.

C   Joel will have 7 treats to give his puppy on Sunday.
This can't happen. Joel has 7 on Thursday, so that would mean he would not give him any on Friday or Saturday. This is wrong because the problem states that he will continue to give his puppy 2 or 3 treats each day.

D   Joel may have 4 treats left on Saturday night.
This also can't happen. I figured that Joel will have at least 4 left on Friday. So, that would mean he would not give him any on Saturday. This is wrong because the problem states that he will continue to give his puppy 2 or 3 treats each day.

After looking over each answer choice and figuring out the treats for the rest of the days, the best answer is choice *A*.

17a Jesus is in charge of feeding breakfast to the pigs on his farm. He feeds them 4 pails of oats every morning. He made a table to keep track of how much oats he has left after feeding breakfast to the pigs.

Pig Breakfast

Day	Oats Left
Sunday	16
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

If Jesus has 16 pails of oats left after feeding them breakfast on Sunday, what is the last day he will most likely have breakfast for the pigs?

A Wednesday

B Thursday

C Friday

D Saturday

17b Mr. Robert's class charted the growth of two plants over a 5-week period for a science project.

Science Project Plant Growth

	Week 1	Week 2	Week 3	Week 4	Week 5
Plant X	1.5 in.	2.3 in.	3.1 in.	3.9 in.	4.7 in.
Plant Y	0.5 in.	1.5 in.	2.5 in.	3.5 in.	4.5 in.

Based on the information in the table, which statement is **most** likely true?

A Plant X will be taller than Plant Y in Week 6.

B Plant Y will be taller than Plant X in Week 6.

C Plant X and Plant Y will stop growing in Week 6.

D Plant Y will be the same height as Plant X in Week 6.

Summary Statement:
These problems involve identifying the change in a quantity over time and making simple predictions.

19   Look at the diagram of Laura's yard.
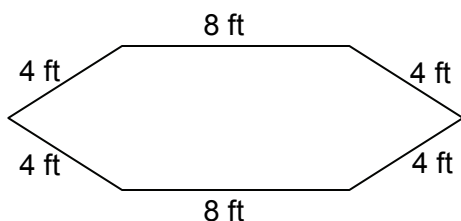
8 ft

4 ft   4 ft

4 ft   4 ft

8 ft

Which expression can Laura use to find the perimeter of her yard?

A   (4 X 4) + (2 X 8)

B   (4 X 8) + (2 X 8)

C   (4 + 4) + (2 + 8)

D   (4 X 8) + (2 X 4)

This problem is asking me to figure out which expression Laura can use to find the *perimeter* of her yard. So, I don't need to find the *perimeter*. I only need to figure out which expression could provide a solution for finding the *perimeter*. I remember that *perimeter* is the distance around something, like if I were to walk around it. It would be how far I walked around it.

I will work this problem as if I were going to solve for the actual *perimeter*.

To find the *perimeter*, I need to add together the length of each side of this figure.

8 ft

4 ft   4 ft

4 ft   4 ft

8 ft
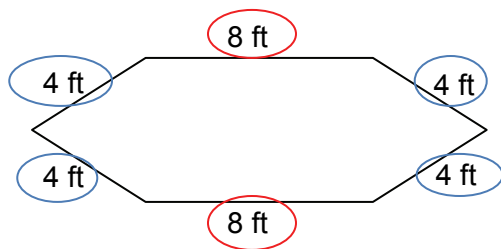
Perimeter = 4 + 8 + 4 + 4 + 8 + 4

Uh oh. That is not an answer choice. It looks like I need to go a step further. Each answer choice has multiplication in it, so I will see how I can make my answer include multiplication.

I count that there are four 4s. That can also be written as 4x4. There are two 8s. That can be written as 2x8.

Perimeter = 4 + 8 + 4 + 4 + 8 + 4

four 4s   two 8s

When I combine them together, I get (4x4) + (2x8). My answer is the same as answer choice **A**.

Perimeter = (4 X 4) + (2 X 8)

19a Omar's math teacher told the class that the first student to score 500 points will be Student of the Week. Omar made a list of his math test scores.

89, 97, 95, 95, 89, 97, 90

Which expression will **not** find the total of Omar's math scores?

A 2 x (89 + 97 + 95 + 90)

B 2 x (89 + 97 + 95) + 90

C 89 + 89 + 90 + 95 + 95 + 97 + 97

D 90 + (2 x 89) + (2 x 95) + (2 x 97)

19b Which statement is **not** true?

A 17 + 6 = 6 + 17

B 52 – 12 = 12 – 52

C 21 x 30 = (20 x 30) + (1 x 30)

D 3 x (19 – 4) = (3 x 19) – (3 x 4)

Summary Statement:
In these problems, students need to analyze common algorithms for computing (adding, subtracting, multiplying, and dividing) with whole numbers using the associative, commutative, and distributive properties.

26   Which expression will **not** solve 59 X 20?

    A   (50 X 20) + (9 X 20)

    B   (59 X 10) + (59 X 10)

    C   (59 X 10) + (1 X 20)

    D   (60 X 20) – (1 X 20)

In this problem, it looks like I have to find different ways to multiply 59 by 20. Because the question asks me which expression will **not** solve 59 x 20, I know that three of the choices should work and one of the choices won't.

I know that one strategy for multiplication is to break apart the numbers and combine them in different ways. I could break apart the 59 or I could break apart the 20.

A   (50 X 20) + (9 X 20)
I see that I have 50 times 20 and 9 times 20. 59 can be broken apart into 50 and 9. If I multiply each of the parts (50 and 9) by 20 this is the same as doing 59 times 20. Choice A will work.

B   (59 X 10) + (59 X 10)
For choice B, I see that I have 59 times 10 and 59 times 10. This time the twenty is broken apart into 10 and 10. If I multiply each of the parts (10 and 10) by 59, this is the same as doing 20 times 59. Choice B will work.

C   (59 X 10) + (1 X 20)
For choice C, I see that I have 59 times 10 and 1 times 20. I do not see that either of my numbers is broken apart in this number sentence. Let me see if I can check in another way. I also know that the expression will be 590 + 20 or 610 because the numbers are easy to calculate. I know that the answer to 59 x 20 is close to 1200 because it is almost 60 times 20. Choice C does not work.

D   (60 X 20) – (1 X 20)
For choice D, I see that I have 60 times 20 minus 1 times 20. This one has subtraction instead of addition. I think this will still work. I can see that 59 can also be written as 60 – 1. If I take these parts (60 and 1) and multiply them both by 20 and subtract, that is the same as doing 59 times 20. Choice D will work.

I will choose answer choice **C**, since it is the only one that does not show another way to multiply 59 and 20.

26a Which expression will **not** solve
72 X 30?

    A   (70 X 30) + (2 X 30)

    B   (72 X 15) + (8 X 15)

    C   (80 X 30) − (8 X 30)

    D   (72 X 15) + (72 X 15)

26b Which expression will **not** solve
473 X 50?

    A   (470 X 50) + (3 X 10)

    B   (500 X 50) − (27 X 50)

    C   (473 X 25) + (473 X 25)

    D   (400 X 50) + (70 X 50) + (3 X 50)

Summary Statement:

In these problems, students should use multiple strategies to multiply whole numbers. This includes two-digit by two-digit and multi-digit by one-digit.

33   Look at the data set.

        51, 35, 28, 49, 28, 46, 29

    What is the median of the data set?

    A 23

    B 28

    C 35

    D 38

This problem wants me to find the *median* of the numbers. I know this!

I remember that *median* is the middle number when all of the numbers are placed in order from least to greatest. I remember that *median* means middle because I think of the median is the thing in the middle of a road that separates the two sides of the street! There are other measures I remember, too. *Mode* is the number that appears most in a data set. And, *range* is the difference of the greatest number and the least number in the data set.

But for this problem, I am using *median*.

    First, I will put the numbers in order.

                51, 35, 28, 49, 28, 46, 29

        28, 28, 29, 35, 46, 49, 51

    Next, I will look for the middle number of the data set.

        28, 28, 29, 35, 46, 49, 51

After I do this, I see that the middle number of the data set is 35, which is answer choice **C**.

This problem had an odd number of data points, so I only had to look for the middle number once they were all in order. If there were an even number of data points, I would have had to find the middle two numbers, and then find the average of those two numbers to find the *median*.

33a   Look at the data set.

50, 16, 18, 23, 34, 35, 45, 44

What is the median of the data set?

A   28.5

B   34

C   34.5

D   35

33b   Look at the data set.

84, 98, 88, 76, 86, 99, 84, 89

What is the mode of the data set?

A   81

B   84

C   87

D   88

Summary Statement:
In these problems, students use median, mode, and range to describe the distribution of a given data set.