Ohio Achievement Tests – 4th Grade Math

Number, Number Sense and Operations

2. Ruth's garden has 6 rows of strawberry plants. There are 20 strawberry plants in each row.

How many strawberry plants are in Ruth's garden?

- O A. 12
- O B. 26
- O C. 80
- O D. 120

6. One month Tony's puppy grew $\frac{7}{8}$ of an inch. The next month his puppy grew $\frac{5}{8}$ of an inch.

How many inches did Tony's puppy grow in two months?

- O A. $\frac{2}{8}$
- O B. $\frac{35}{64}$
- O C. $\frac{12}{16}$
- O D. $\frac{12}{8}$

3. Which is the same as 480,072?

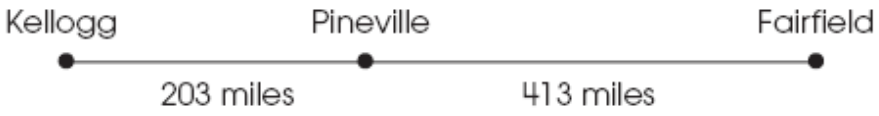
- O A. 400 + 80 + 70 + 2
- O B. 4,000 + 80 + 700 + 2
- O C. 40,000 + 80,000 + 70 + 2
- O D. 400,000 + 80,000 + 70 + 2

4. Some fractions are less than one. Some fractions are equal to one. Some fractions are greater than one.

Write a fraction that is equal to one. _____

Use words, pictures or numbers to show or explain why your fraction is equal to one.

5. The distance between three towns is shown.



Estimate the distance from Kellogg to Fairfield.

- O A. 500 miles
- O B. 600 miles
- O C. 700 miles
- O D. 800 miles

6. Which is a prime number between 20 and 30?

- O A. 21
- O B. 23
- O C. 25
- O D. 27

7. A store sells rice in 3-pound and 5-pound bags. Jennie is responsible for packing 60 pounds of rice into the 3-pound bags, 5-pound bags or a combination of 3-pound and 5-pound bags. She needs to pack all 60 pounds of rice.

The prices for the bags of rice are shown in the chart.

Bags of Rice

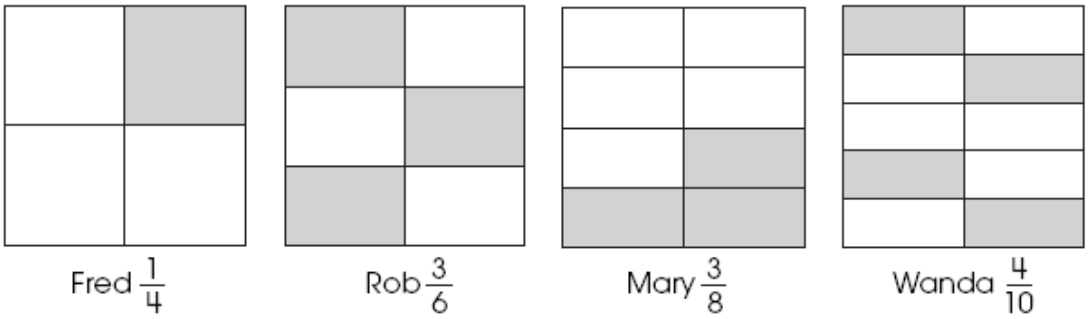
Weight	Price
3 pounds	$4 a bag
5 pounds	$6 a bag

Show three ways Jennie can pack the 60 pounds of rice into bags. For each way, show the total number of bags for each weight she will have packed. Show or explain your answer by using pictures, words or numbers.

Question continued on the next page.

Show which of your three ways will make the most money when all the bags Jennie packs are sold. Explain your answer by using pictures, words or numbers.

8. Four students shaded rectangles to represent different fractions.



Fred $\frac{1}{4}$ Rob $\frac{3}{6}$ Mary $\frac{3}{8}$ Wanda $\frac{4}{10}$

Which fraction is greatest?

- ○ A. $\frac{1}{4}$
- ○ B. $\frac{3}{6}$
- ○ C. $\frac{3}{8}$
- ○ D. $\frac{4}{10}$

9. Gavin bought a puzzle that costs $6.35. He gave the clerk a $10 bill.

How much change should Gavin receive? _____

Give an example of the bills and coins Gavin could receive for change. Use numbers, pictures or words to show your work.

10. The elevation of Campbell Hill is 1,565 feet.

What is this number rounded to the nearest hundred?

- O A. 1,500 feet
- O B. 1,550 feet
- O C. 1,600 feet
- O D. 2,000 feet

11. Camille buys a pair of shoes for $15.95. She gives the clerk $20.00.

How much change should Camille receive?

- O A. $4.00
- O B. $4.05
- O C. $4.15
- O D. $5.05

12. Shiloh has 823 pennies. Lester has 988 pennies.

How many pennies do Shiloh and Lester have together?

- O A. 1,701
- O B. 1,711
- O C. 1,801
- O D. 1,811

13. Kimberly has $2.31 in one pocket and $1.94 in another.

How much money does Kimberly have in both pockets?

- O A. $0.37
- O B. $1.37
- O C. $3.25
- O D. $4.25

14. Four girls ran in a race. Their times are shown in the table.

Runner	Time (seconds)
June	12.03
Beth	12.3
Meg	12.033
Sarah	12.303

Which list shows the students' times from least time to greatest time?

- O A. 12.033; 12.03; 12.3; 12.303
- O B. 12.03; 12.033; 12.3; 12.303
- O C. 12.03; 12.033; 12.303; 12.3
- O D. 12.3; 12.03; 12.033; 12.303

15. Heidi and James each have a bottle of juice that is the same size. Heidi drank $\frac{1}{4}$ of her juice. James drank $\frac{1}{3}$ of his juice.

Who drank more juice? _____

Use pictures, words or numbers to show how you know.

16. What is a prime number?

Give three examples of prime numbers.

17. Stamps are sold in rolls of 100 and books of 20. Zoe bought two rolls and eight books of stamps.

What is the total number of stamps Zoe bought?

- O A. 240
- O B. 360
- O C. 960
- O D. 1,200

18. Aaron saved $60 to buy airplane models for his collection. The cost of each model with tax included is $7.

How many models can he buy?

- ○ A. 4
- ○ B. 8
- ○ C. 9
- ○ D. 12

19. Eight students are shown.

Write a fraction and a decimal that represents the number of students wearing hats.

20. The numbers of students in four classes are shown in the table.

Number of Students in Each Class

Class	Number of Students
Mr. Willard	19
Ms. Smith	23
Ms. Rose	27
Mr. Hiller	29

Which class can be divided into equal-sized groups that contain more than one student?

- O A. Mr. Willard's class
- O B. Ms. Smith's class
- O C. Ms. Rose's class
- O D. Mr. Hiller's class

21. Erik walked Mrs. Johnson's dog each day for six days. He earned $1.25 each day.

How much money did Erik earn?

- O A. $4.75
- O B. $6.25
- O C. $7.25
- O D. $7.50

22. There are about 525,600 minutes in a year.

What is this number rounded to the nearest thousand?

- O A. 500,000
- O B. 525,000
- O C. 526,000
- O D. 530,000

23. Calvin gathered data on the number of people who live in five cities.

City	Number of People
St. James	109,026
Olivia	20,055
Franklin	111,402
Palmer	19,986
Trinity	109,000

Which city has more people than St. James?

- O A. Olivia
- O B. Franklin
- O C. Palmer
- O D. Trinity

24. There were 1,479 people at the movie theater on Saturday and 1,753 people on Sunday.

How many people went to the movie theater on Saturday and Sunday?

- O A. 2,232
- O B. 3,132
- O C. 3,222
- O D. 3,232

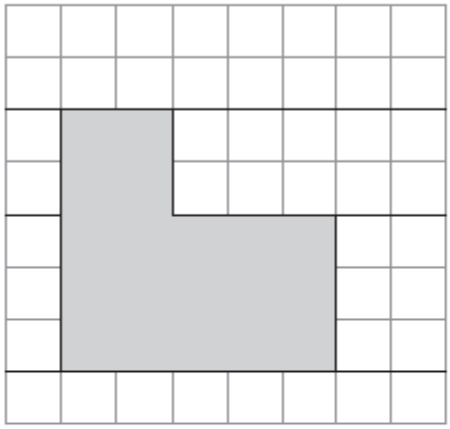
Measurement Standard

1. Paco is filling his fish tank with water.

   Which container should Paco use to make the fewest trips to the faucet?

   - ○ A. one-cup container
   - ○ B. one-gallon container
   - ○ C. one-pint container
   - ○ D. one-quart container

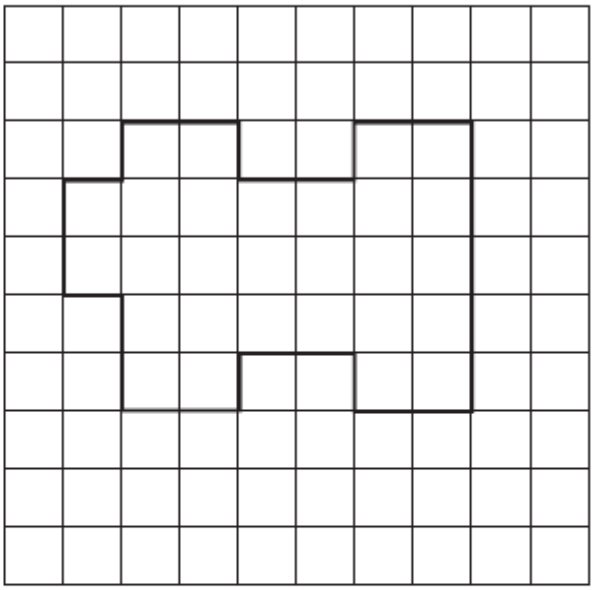
2. A figure is shown on the grid.



   What is the area of the figure?

   - ○ A. 16 square units
   - ○ B. 19 square units
   - ○ C. 20 square units
   - ○ D. 25 square units

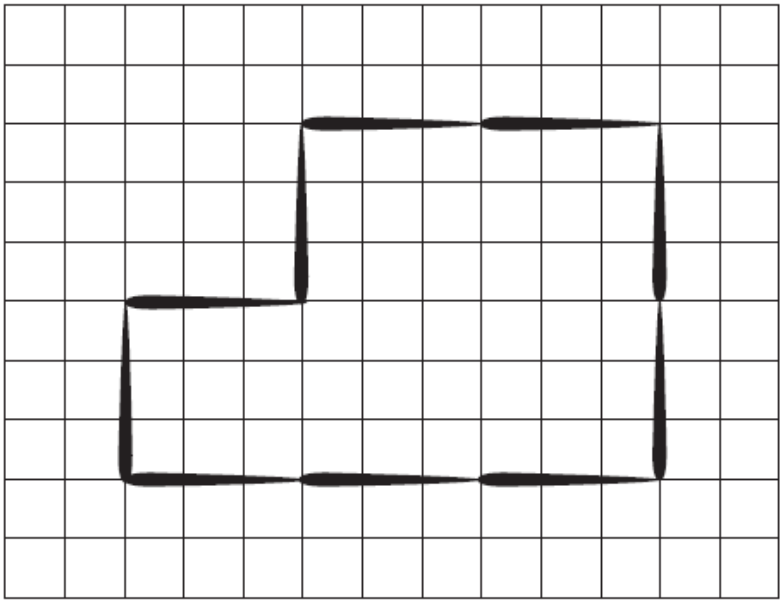
3. Abdul counted the number of units around the outside of the shape shown.



Which measurement did Abdul find?

- ○ A. area
- ○ B. height
- ○ C. perimeter
- ○ D. volume

4. Randy made this shape with toothpicks.

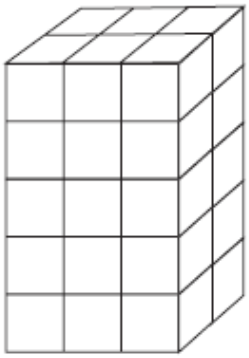


Each | = 1 Toothpick = 3 inches

What is the perimeter of the shape in inches? _____

Describe how you found the length of the perimeter.

5. Torrance made a tower that is three cubes long, five cubes high and two cubes wide.



How many cubes in all did he use to make the tower?

- O A. 10
- O B. 22
- O C. 30
- O D. 31

6. Sheila bought a new hamster cage.

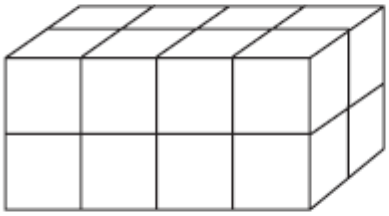
Which unit of measure would be used to describe the volume of the hamster cage?

- O A. cubic inches
- O B. yards
- O C. square inches
- O D. square feet

7. Rachel's father is filling a small swimming pool. He has a one-cup container and a one-gallon container.

Tell which container is more reasonable to use to fill the pool and explain why.

8. Becky stacked blocks as shown. Each block has a volume of one cubic inch.



What is the volume of Becky's stack of blocks?

- O A. 12 cubic inches
- O B. 13 cubic inches
- O C. 16 cubic inches
- O D. 20 cubic inches

9. What unit of measurement is likely to be used to find the length of a border around a bulletin board?

- O A. inches
- O B. square feet
- O C. cubic yards
- O D. miles

10. Which unit is appropriate for measuring the area of the bottom of a pan?

- O A. inch
- O B. foot
- O C. square inch
- O D. cubic foot

11. Robin measured the length of a piece of rope and found it to be 12 feet long.

What would happen to the number of units if Robin measured the length of the rope in yards instead of feet?

- O A. There would be no units.
- O B. There would be more units.
- O C. There would be fewer units.
- O D. There would be the same number of units.

Data Analysis and Probability Standard

1. Alan will be gathering data about the temperature.

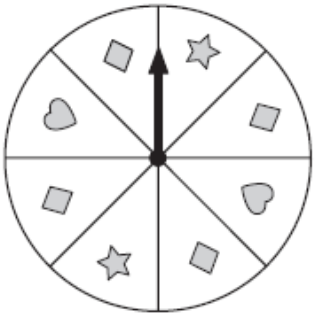
   Which part of Alan's data collection plan should come first?

   - O A. create a graph to display the data
   - O B. record the data
   - O C. choose a place and time to collect the data each day
   - O D. interpret the data

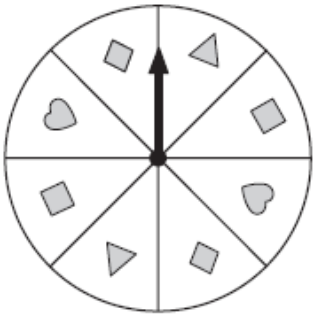
2. Which spinner has a probability of 0 for landing on a star, ☆?

O A.

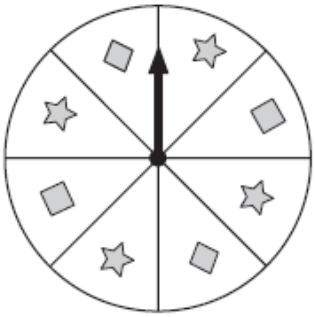
O B.



O C.



O D.



3. Reuben recorded the heights of 7 boys and 7 girls in his class in the table shown.

Height (in inches)	
Boys	Girls
47	49
50	50
51	52
53	55
53	56
55	56
58	58

Calculate the range, the median and the mode for the height of the boys and for the height of the girls.

Range:

Boys _____

Girls _____

Median:

Boys _____

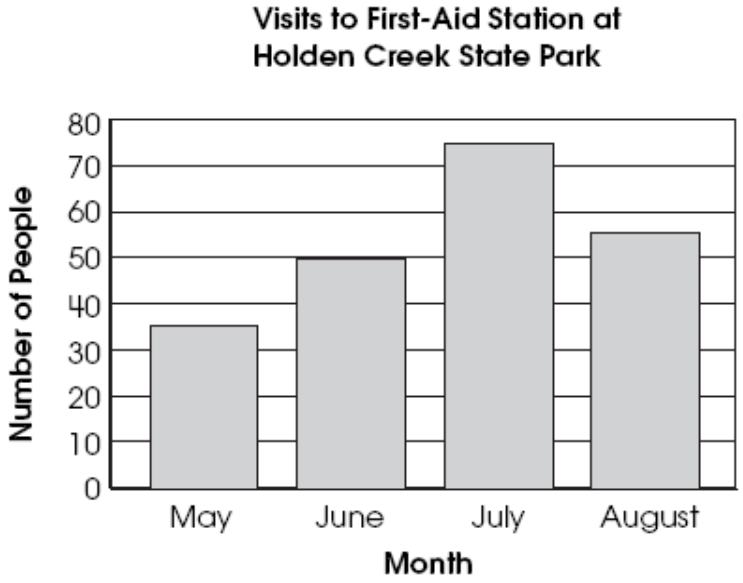
Girls _____

Mode:

Boys _____

Girls _____

4. The bar graph shows the number of people who visited the first-aid station at Holden Creek State Park each month last summer.



How many more people visited the first-aid station in July than in May?

- O A. 15 people
- O B. 20 people
- O C. 40 people
- O D. 110 people

5. The table shows the number of different-colored tiles Anita placed in a bag.

Tiles in Bag

Color	Number of Tiles in Bag
Red	6
Blue	11
Yellow	15
Green	5

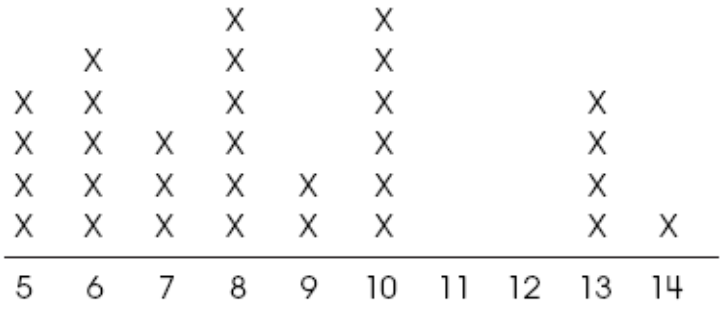
Anita picked one tile from the bag without looking.

Which shows the colors listed in order from the least likely to be picked to the most likely?

- O A. green, red, yellow, blue
- O B. green, red, blue, yellow
- O C. yellow, blue, green, red
- O D. red, blue, yellow, green

6. Andrea made a line plot of the ages of children at summer camp.

Ages of Children at Summer Camp



Which is true about the data in the line plot?

- O A. The data are spread out evenly.
- O B. The data have a hole between 10 and 13.
- O C. There is a clump of data between 10 and 13.
- O D. The range and the median are the same.

7. Calvin plans to plant one type of flower and one type of vegetable in his garden. He chooses the plants from the table shown.

Plants

Flowers	Vegetables
Roses	Carrots
Tulips	Peas

Which list shows all the different combinations of one flower and one vegetable that Calvin can plant?

- O A. roses and carrots, roses and peas
- O B. roses and carrots, roses and peas, tulips and carrots, tulips and peas
- O C. roses and carrots, tulips and peas, roses and tulips, carrots and peas
- O D. roses and carrots, roses and peas, roses and tulips, tulips and carrots, tulips and peas, carrots and peas

8. Ramón's uncle is buying an automobile. He needs to choose a outside color and an inside color.

Color Choices

Outside Color	Inside Color
Blue	Gray
Red	Tan

What are all the possible combinations of one outside color and one inside color that he could choose?

- O A. blue and gray, blue and tan, red and gray, red and tan
- O B. blue and red, blue and gray, blue and tan, blue and blue
- O C. gray and tan, red and blue
- O D. gray and red, gray and blue

9. Twelve students wrote their names and the number of letters in their names on cards as shown.

Grant 5	Ali 3	Courtney 8	Kim 3	Owen 4	Heidi 5
Katie 5	Mark 4	Linda 5	June 4	Abdul 5	Connie 6

Use the line to construct a line plot of the information on the students' cards. Use **X** to show the data.

2 3 4 5 6 7 8

Number of Letters in Names

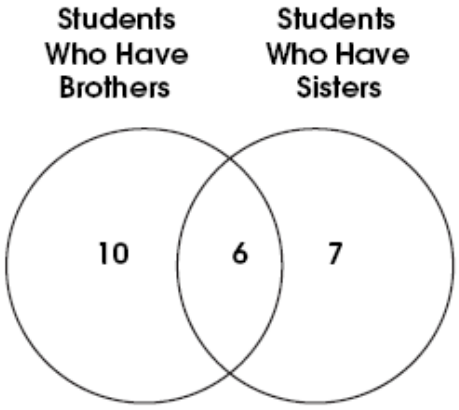
Find the median, mode and range of the data on the cards.

Median: _____

Mode: _____

Range: _____

10. The Venn diagram shows the number of students in a class who have brothers and sisters.



Which statement is true?

- A. Exactly 6 students in the class have brothers.
- B. Exactly 10 students in the class have brothers.
- C. Exactly 16 students in the class have brothers.
- D. Exactly 23 students in the class have brothers.

11. Fred recorded the heights, in inches, of the students in his class. The range of the data was 15.

Which statement is true about Fred's data?

- A. Fred found that 15 students are all the same height.
- B. The height of the shortest student is 15 inches.
- C. Fred recorded the heights of 15 students in his class.
- D. The tallest student is 15 inches taller than the shortest student.

12. Raymond has these notebooks and pens in his backpack.

Raymond's Backpack

Notebook	Pens
Science	blue
Reading	green
Writing	red

List all the possible combinations of one notebook and one pen that Raymond could take from his backpack.

13. Ken goes grocery shopping once a week and keeps track of how much money he spends. He made a bar graph and a line plot to display these data.

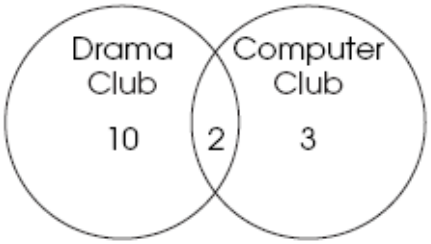
What information can be found only on the bar graph?

- O A. the number of weeks he shopped
- O B. the week he spent the least money
- O C. the most money he spent in one week
- O D. the least money he spent in one week

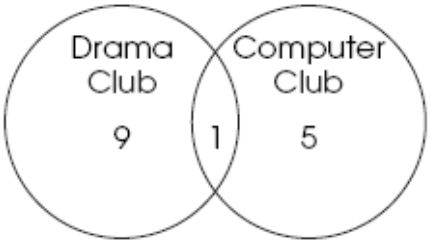
14. Mrs. Allen has 15 students. Eight students belong to the drama club and 10 students belong to the computer club. Some students belong to both clubs.

Which Venn diagram represents these data?

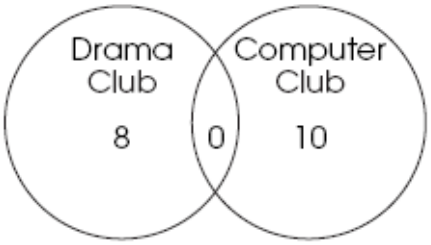
○ A.



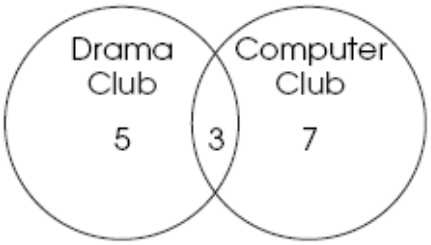
○ B.



○ C.

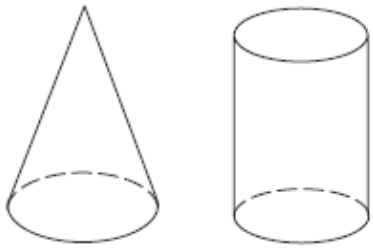


○ D.



Geometry and Spatial Sense Standard

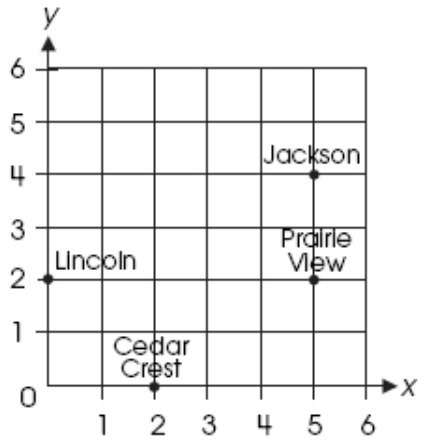
1. A cone and a cylinder are shown.



Give one way that a cone and a cylinder are alike.

Give one way that a cone and a cylinder are different.

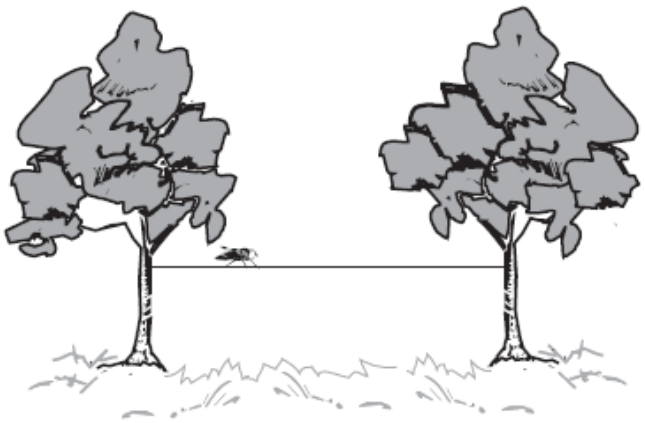
2. Mr. Yang is driving to the school located at (2, 0) on the coordinate grid.



Which school is located at (2, 0)?

- A. Cedar Crest
- B. Jackson
- C. Lincoln
- D. Prairie View

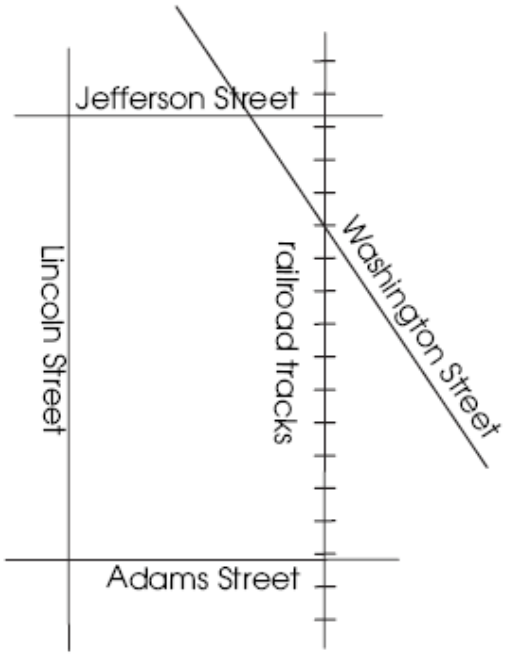
3. A bug lands on a rope stretched between two trees on a lawn at a park.



Which object (the bug, the rope, the lawn, the park) is best described as a point?

- O A. bug
- O B. rope
- O C. lawn
- O D. park

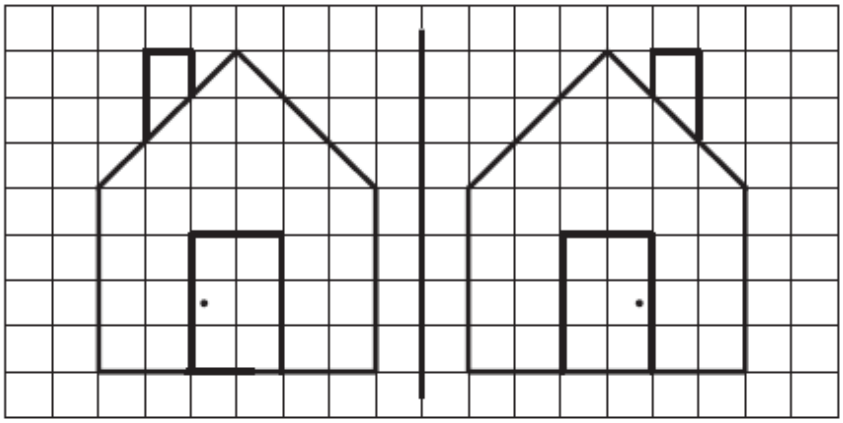
4. A map of Andrew's neighborhood is shown. Andrew lives on the street that appears to be parallel to the railroad tracks.



On which street does Andrew live?

- O A. Washington Street
- O B. Lincoln Street
- O C. Adams Street
- O D. Jefferson Street

5. The grid shows two shapes.

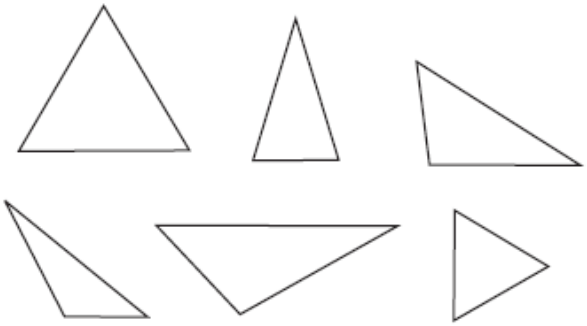


Shape 1 **Shape 2**

What transformation changed shape 1 to shape 2?

- ○ A. rotation (turn)
- ○ B. translation (slide)
- ○ C. reflection (flip)
- ○ D. no transformation

6. Six triangles are shown.



Circle each triangle that appears to be scalene.

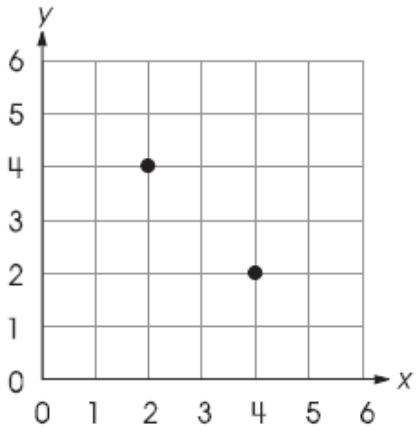
Explain how you decided which triangles are scalene.

7. The shapes shown are part of a design.

What do all these shapes appear to have in common?

- O A. All have four right angles.
- O B. All have at least one set of parallel sides.
- O C. All have four equal angles.
- O D. All have at least one set of perpendicular lines.

8. Two points are shown on the coordinate grid.



Plot two more points on the grid so that the four points make a square. Label the new points J and K.

What are the coordinates of points J and K?

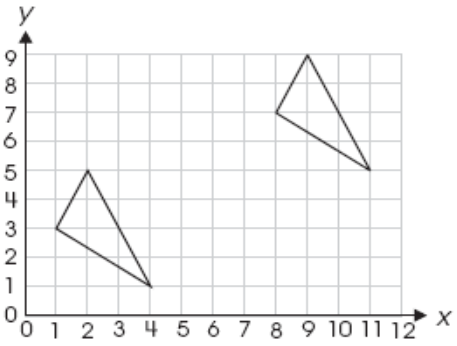
Point J _____

Point K _____

9. Which letter has a pair of parallel line segments?

- ○ A. A
- ○ B. H
- ○ C. L
- ○ D. K

10. Two triangles are drawn on the grid.



Which transformation — reflection (flip), translation (slide) or rotation (turn) — can Bill use to determine whether the two triangles are congruent? _____

Explain how this transformation shows Bill that the two triangles are congruent.

11. Roy drew a triangle with exactly two congruent angles and two congruent sides.

What kind of triangle did Roy draw?

- O A. equiangular
- O B. equilateral
- O C. isosceles
- O D. scalene

12. How are a rhombus and a square alike?

- O A. They both have four equal sides.
- O B. They both have four right angles.
- O C. They both have four equal angles.
- O D. They both have only one pair of parallel sides.

Patterns, Functions, and Algebra Standard

1. Courtney starts with 12 birdhouses. She makes three new birdhouses each week.

   Which pattern shows the number of birdhouses Courtney has at the end of each week?

   - O A. 3, 6, 9, 12
   - O B. 3, 15, 27, 39
   - O C. 12, 15, 18, 21
   - O D. 12, 24, 36, 48

2. Lyn and Kris were picking up pine cones. Every 15 minutes they counted to check the total number of pine cones they had picked up. The chart shows their results.

Time	Lyn's Pine Cones	Kris' Pine Cones
1:15 p.m.	8	16
1:30 p.m.	15	30
1:45 p.m.	22	44
2:00 p.m.	31	62

   Which statement is true according to the data in the chart?

   - O A. Kris always picked up 8 more pine cones than Lyn.
   - O B. Kris and Lyn picked up the same number of pine cones every 15 minutes.
   - O C. Kris picked up fewer pine cones than Lyn.
   - O D. Kris picked up twice as many pine cones as Lyn.

3. Mai Lee is buying notebooks. The first notebook costs $0.78 and each additional notebook costs $0.22.

Which table shows the cost of the notebooks?

○ A.

Number of Notebooks	Cost
1	$0.22
2	$0.44
3	$0.66
4	$0.88
5	$1.10

○ B.

Number of Notebooks	Cost
1	$0.78
2	$1.00
3	$1.22
4	$1.44
5	$1.66

○ C.

Number of Notebooks	Cost
1	$0.78
2	$1.56
3	$2.34
4	$3.12
5	$3.90

○ D.

Number of Notebooks	Cost
1	$1.00
2	$1.22
3	$1.44
4	$1.66
5	$1.88

4. A theater has 14 rows of seats. Each row has the same number of seats. The theater has a total of 168 seats.

Which equation can be used to find the number of seats, s, in each row?

○ A. $168 \times 14 = s$

○ B. $14 \times s = 168$

○ C. $168 - s = 14$

○ D. $14 + s = 168$

5. Casey made the pattern shown.

8, 19, 30, 41, ____, ____, ____

What are the next three numbers?

Describe the pattern.

5. Alice has 12 markers. Ben has half as many markers as Alice. M is the number of markers that Ben has.

Which equation can Ben use to find the number of markers that he has?

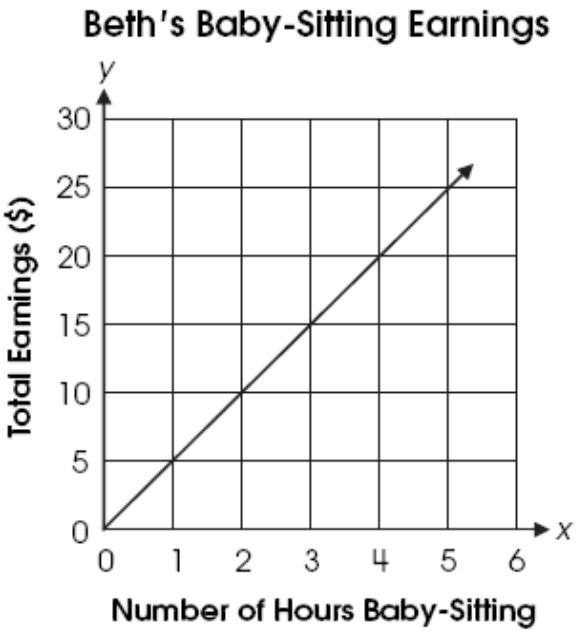
- O A. $12 \div 2 = M$
- O B. $12 + 2 = M$
- O C. $12 \times 2 = M$
- O D. $12 - 2 = M$

6. Susan saved 50 bottle caps for her school. She plans to save 2 more bottle caps each week.

Which expression tells the total number of bottle caps Susan saves after w weeks?

- O A. $50 + 2w$
- O B. $50 + 2 + w$
- O C. $50w + 2$
- O D. $50w + 2w$

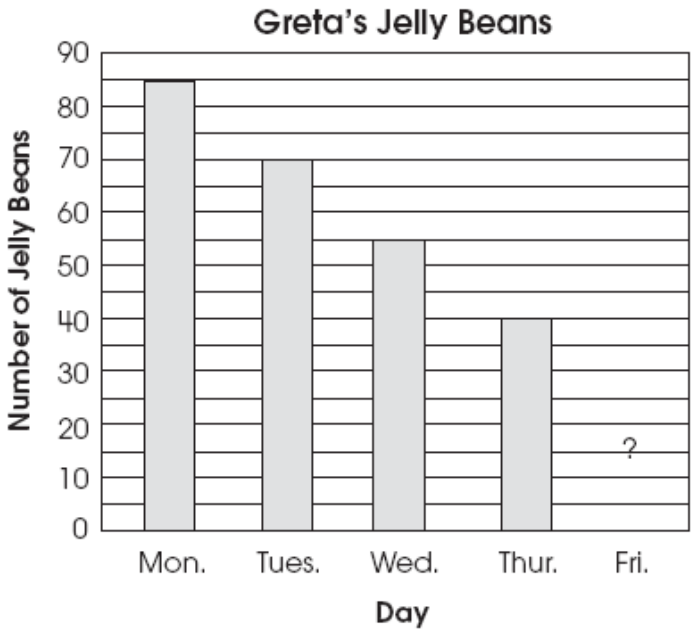
7. The graph shows Beth's earnings while baby-sitting.



Which statement describes how Beth's total earnings change as the number of hours of baby-sitting increases?

- O A. For every hour, the amount she earns doubles.
- O B. For every five hours, the amount she earns increases by $1.
- O C. For every five hours, the amount she earns increases by $10.
- O D. For every hour, the amount she earns increases by $5.

8. The bar graph shows the total number of jelly beans that Greta has each day. The pattern for the number of jelly beans will continue.



How many jelly beans will Greta have on Friday?

- O A. 15
- O B. 25
- O C. 30
- O D. 35

9. A bakery offers a special deal when buying muffins. The table shows how the price per muffin changes.

Muffin Prices

Number of Muffins	Price per Muffin
6	$1.00
12	$0.75
18	$0.60
24	$0.50

Which describes how the price per muffin changes as the number of muffins bought increases?

- O A. For every 6 muffins bought, the price per muffin decreases by $0.25.
- O B. For every 6 muffins bought, the price per muffin is halved.
- O C. For every 6 muffins bought, the price per muffin decreases.
- O D. For every 6 muffins bought, the price per muffin increases.

10. Riley is making a pattern with numbers.

3, 12, 21, 30

What is the rule for this pattern?

- O A. add 3
- O B. multiply by 4
- O C. add 9
- O D. multiply by 10

11. Kim is making cookies. She puts 3 raisins on each cookie.

How many raisins does she need to make 15 cookies? _____

Now, write an expression that tells the number of raisins Kim needs to make any number of cookies. Use *n* to represent the number of cookies.

12. Anthony's family plants 15 trees each weekend.

Construct a table showing the total number of trees Anthony's family planted after 1, 2, 3, 4, and 5 weekends.

Describe the pattern that tells the number of trees that the family has planted.

13. Scott added seven to a number, and the answer was less than 12.

Which inequality represents this situation?

- O A. $12 - 7 < \boxed{?}$
- O B. $\boxed{?} + 12 < 7$
- O C. $\boxed{?} - 7 < 12$
- O D. $\boxed{?} + 7 < 12$

14. Matt recorded the total number of pennies he has saved at the end of each week in the table shown.

Week	Number of Pennies
1	3
2	?
3	12
4	?
5	48

Each week, Matt doubles the number of pennies he has saved. He forgot to record the total number of pennies in week 2 and week 4.

Which completed table shows the correct number of pennies for weeks 2 and 4?

○ A.

Week	Number of Pennies
1	3
2	6
3	12
4	18
5	48

○ B.

Week	Number of Pennies
1	3
2	6
3	12
4	24
5	48

○ C.

Week	Number of Pennies
1	3
2	6
3	12
4	12
5	48

○ D.

Week	Number of Pennies
1	3
2	5
3	12
4	14
5	48