Algebra Summer Packet Name:_____

This packet is designed to keep the concepts that you learned this year fresh in your mind.

It is highly suggested that you don't just put off the the entire packet until the last week of summer vacation. Studies show that incremental work actually helps you remember content better than cramming it in all at once.

There are 100 questions in this packet, and about 10 weeks in your summer vacation. You do the math as to how many questions should be completed (approximately) per week.

If you need help or have a question you can:

1) Ask a friend
2) Ask an enemy
3) Check Khanacademy.com or purplemath.com for help
4) Ask on Google Classroom
5) Email me privately

Have fun, enjoy the break, and don't worry, a whole lot more math awaits you next year!!!!

1) Avery received $80 in cash for mowing lawns. She did the following with the $80.

- put 20% of the $80 into a bank account
- spent $\frac{1}{4}$ of the $80
- kept the rest of the $80 in cash

How much of the $80 did Avery keep as cash?

A. $36
B. $44
C. $45
D. $48

2) Tyler cut a $40\frac{1}{8}$-inch board into 3 pieces of equal length. He then cut 3 $\frac{3}{4}$ inches off of each piece to make smaller boards. What is the length of each of the smaller boards?

A. $9\frac{5}{8}$ inches
B. $10\frac{3}{8}$ inches
C. $12\frac{1}{8}$ inches
D. $33\frac{3}{8}$ inches

3) The circumference of the circular table on Colton's porch is 72π inches. What is the radius of the table?

A. 18 inches
B. 36 inches
C. 72 inches
D. 144 inches

4) At a restaurant, customers can order a hamburger, a cheeseburger, or a chicken sandwich as their main dish. With any of these main dishes they can order a side of french fries or a salad. The table below shows the orders placed by the last 50 customers.

Restaurant Orders

Main Dish	Side	Number of Orders
hamburger	french fries	17
	salad	4
cheeseburger	french fries	11
	salad	6
chicken	french fries	9
	salad	3

Based on the orders of the last 50 customers, which is the **best** estimate of the probability the next customer will order a salad with their main dish?

A. 13%

B. 25%

C. 33%

D. 50%

5) Phil used 3 gallons of paint to cover 1,125 square feet of a wall. At this same rate, what is the total area of the wall, in square feet, that Phil will cover using 5 gallons of paint?

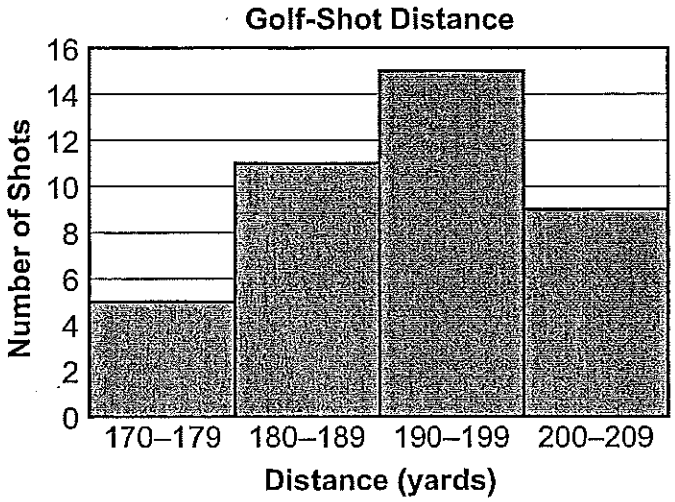
A. 675 square feet

B. 1,575 square feet

C. 1,800 square feet

D. 1,875 square feet

6) Tanisha hit 40 golf shots and measured the distance of each shot. Her results are shown below.



What is the experimental probability that Tanisha hits a shot that is in the 180–189 yard range?

A. $\frac{11}{40}$

B. $\frac{2}{5}$

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

D. $\frac{29}{40}$

7) Last year Jan had 25 model airplanes in her collection. This year she has 32% more model airplanes. Jan then gave her brother 6 model airplanes to start a collection. How many model airplanes does Jan have after she gave 6 to her brother?

A. 8

B. 27

C. 33

D. 51

8) Megan uses $\frac{2}{3}$ cup of almonds to make 4 cups of trail mix. Using this same proportion, how many cups of almonds would Megan need to make 9 cups of trail mix?

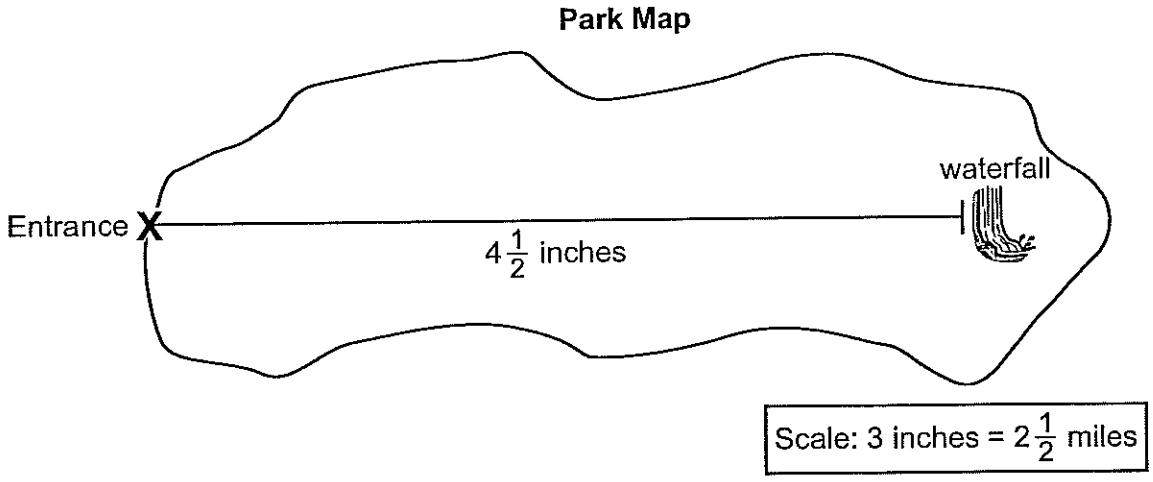
A. $1\frac{1}{2}$ cups

B. $1\frac{7}{12}$ cups

C. $2\frac{11}{12}$ cups

D. $3\frac{3}{8}$ cups

9) The distance on a map between the entrance of a park and a waterfall inside the park is $4\frac{1}{2}$ inches.



What is the actual distance from the entrance of the park to the waterfall?

A. 3.75 miles

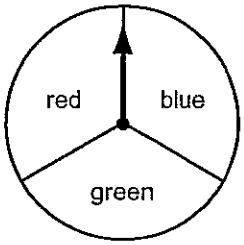
B. 4 miles

C. 5 miles

D. 5.4 miles

10) Rodney is going to perform an experiment. He will do multiple trials of flipping a coin once and then spinning the spinner shown below once.

Rodney's Spinner

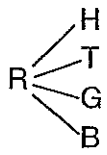


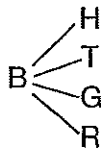
Rodney needs to create a model to represent his sample space of the experiment. In the model he will use the following abbreviations: H = heads, T = tails, R = red, B = blue, and G = green. Which model could Rodney use to **best** represent the sample space for his experiment?

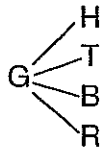
A. HR TR RB
HB TB BG
HG TG GR

C. HR HB HG
RH BH GH
TR TB TG
RT BT GT

B.







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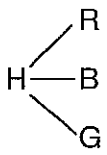
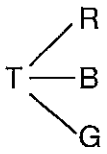




Use the expression below to answer the question.

$$20 + 8y - 9y - 21$$

11) Which expression is equivalent?

A. $2(10 + 4y - 7y - 19)$

B. $2(10 + 4y) - 3(3y - 7)$

C. $4(5 + 2y - 5y - 17)$

D. $4(5 + 2y) - 3(3y + 7)$

12) Mr. Fletcher has a box containing bags of different types of chips. The number of bags and types of chips are shown in the table below.

Bags of Chips

Type of Chips	Number of Bags
plain	3
corn	8
nacho	5
cheddar	4

He will randomly give one bag of chips to each of his 20 students. Nelson is one of the students in Mr. Fletcher's class. Which statement about the likelihood of Nelson receiving different types of chips is true?

A. Nelson is less likely to receive either plain or nacho chips than cheddar chips.

B. Nelson is twice as likely to receive cheddar chips as he is to receive corn chips.

C. Nelson is equally as likely to receive corn chips as he is to receive either plain or nacho chips.

D. Nelson is more likely to receive nacho chips than plain chips and less likely to receive nacho chips than cheddar chips.

13) Chico is saving for new shoes that cost $87. He already has $9 saved, and he will save the same amount each week. Chico wants to buy the shoes in 6 weeks. The inequality shown below can be used to determine x, the amounts that Chico can save each week and still buy the new shoes in 6 weeks.

$$9 + 6x \geq 87$$

What is the least amount Chico can save each week and still buy the new shoes in 6 weeks?

A. $9

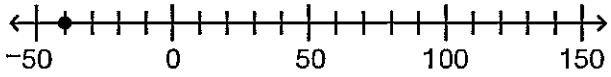
B. $13

C. $15

D. $16

14) In a game, Janeesa started with 0 points. She then earned 50 points, lost 80 points, and earned 10 points. Which number line shows Janeesa's ending score in the game?

A.



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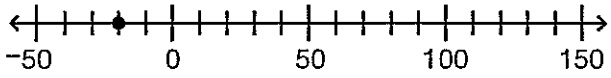

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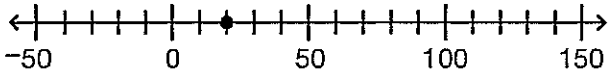
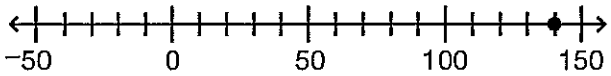


D.



15) Which situation can be represented by the equation $y = 8x$?

A. Nilay bought x items at a store. Each item costs \$8. Nilay spent a total of y dollars at the store.

B. Nilay baked y batches of cookies. There were 8 cookies in each batch. Nilay baked a total of x cookies.

C. Nilay correctly answered x questions on a quiz. Each question was worth y points. Nilay received a total of 8 points on the quiz.

D. Nilay earned \$8 for babysitting. He also earned x dollars for mowing lawns. Nilay earned a total of y dollars for babysitting and mowing lawns.

16) Tamara is trying to determine if a greeting card maximizes the area of her photo. The photo on the greeting card is $2\frac{1}{4}$ inches by $3\frac{3}{4}$ inches. Tamara estimated the area of the photo. Which statement correctly compares the estimated area and the exact area of the photo?

A. The estimate 2×4 is larger than the exact answer and is within 1 square inch.

B. The estimate 2×4 is smaller than the exact answer and is within 1 square inch.

C. The estimate $2 \times 3 + 1$ is larger than the exact answer and is within 1 square inch.

D. The estimate $2 \times 3 + 1$ is smaller than the exact answer and is within 1 square inch.

Use the equation below to answer the question.

$$\left(-\frac{1}{3}\right) \div 27 = x$$

17) Which equation could be solved to also find x?

A. $-27 \times 3 = x$

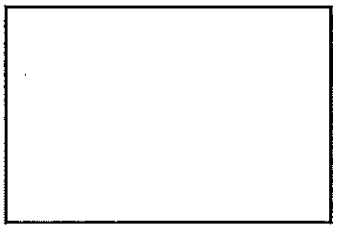
B. $-27 \div 3 = x$

C. $-1 \div (27 \div 3) = x$

D. $-1 \div (27 \times 3) = x$

18) A school is designing two parking lots. The design for the first parking lot is shown below.

First Parking Lot Design



The second parking lot is being designed so that its perimeter is $\frac{3}{4}$ of the perimeter of the first parking lot. The perimeter of the second parking lot can be represented by the expression shown below.

$$\frac{3}{4}\left(2(2 + 4k) + 2\left(3 + \frac{3}{2}k\right)\right)$$

Which other expression also represents the perimeter of the second parking lot?

A. $\frac{15}{2} + \frac{33}{4}k$

B. $\frac{15}{2} + 11k$

C. $9 + 9k$

D. $10 + 11k$

Use the expression below to answer the question.

$$-\frac{3}{4} \times \frac{2}{5}$$

19) Which situation can be modeled by the expression?

A. Zach owes $\frac{3}{4}$ of the original price of his car. Each month he pays $\frac{2}{5}$ of the original price. How many months will it take Zach to pay off his car?

B. Zach owes $\frac{3}{4}$ of the original price of his car. Each month he pays $\frac{2}{5}$ of how much he still owes on the car. What fraction of the original price does Zach owe after this month's payment?

C. Abdi owes Kim $\frac{3}{4}$ of a dollar. He needs to borrow more money from Kim. Abdi then borrows $\frac{2}{5}$ of how much he owes. By what fraction of a dollar does the amount Abdi owes Kim change?

D. Abdi owes Kim $\frac{3}{4}$ of a dollar. He pays her $\frac{2}{5}$ of how much he owes. What fraction of a dollar does Kim receive from Abdi?

20) Angles F and G are complementary angles. Angles G and H are supplementary angles. The degree measure of each angle is a whole number. What is the smallest possible measure of angle H?

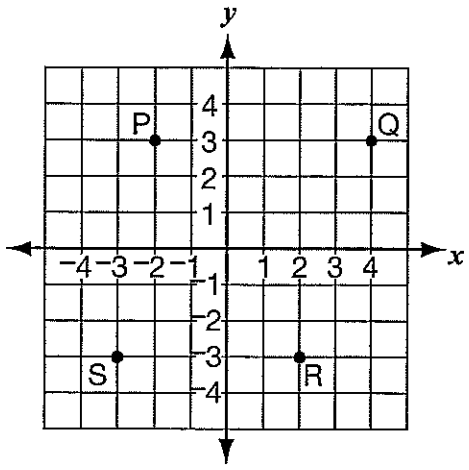
A. 1°

B. 89°

C. 91°

D. 179°

Galina plotted the points below on a coordinate grid.



21) Which two points are exactly 6 units apart on the coordinate grid?

A. P and Q

B. Q and R

C. R and S

D. S and P

22) Miguel's scooter can travel at a maximum speed of 45 miles per hour. Which inequality models all the speeds, s, at which Miguel's scooter can travel?

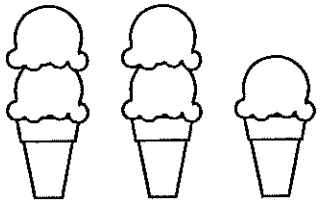
A. $s < 45$

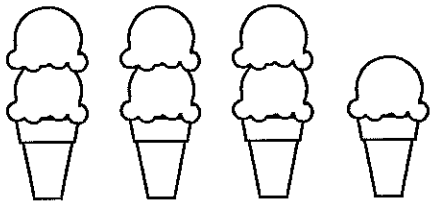
B. $s > 45$

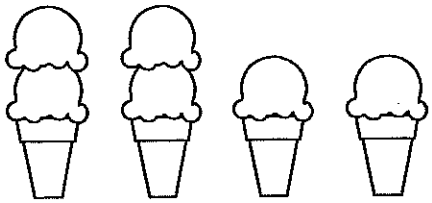
C. $s \leq 45$

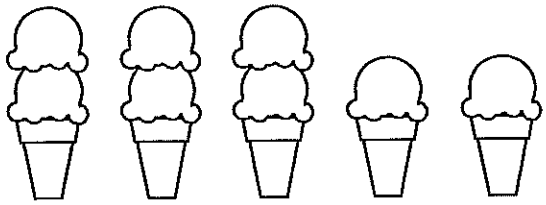
D. $s \geq 45$

23) Of the 12 people in line at an ice-cream shop, 8 ordered cones with 2 scoops of ice cream. The rest ordered cones with 1 scoop of ice cream. Which picture models this ratio?

A. 

C. 

B. 

D. 

24) Mr. Marquis had a metal pipe that was 1,000 cm in length. He cut the pipe into 16 shorter pieces of equal length. Mr. Marquis used the expression below to find the length of each of the smaller pieces of pipe.

1,000 ÷ 16

What is the length of each of the smaller pieces of pipe?

A. $62\frac{1}{2}$ cm

B. 62.8 cm

C. $63\frac{1}{2}$ cm

D. 63.8 cm

25) Chris is trimming trees. He can trim $\frac{2}{3}$ of a tree in $\frac{1}{2}$ of an hour. At what rate can Chris trim trees?

A. $\frac{1}{6}$ of a tree per hour

B. $\frac{1}{3}$ of a tree per hour

C. $1\frac{1}{6}$ trees per hour

D. $1\frac{1}{3}$ trees per hour

26) Each week, a cook purchases 12 pounds of butter. During the last year, the cook has paid as little as $23.04 and as much as $29.40 for the butter purchased in a week. What is the difference between the greatest price per pound and the least price per pound of butter the cook has paid during the last year?

A. $0.53

B. $1.92

C. $2.45

D. $4.37

27) A baseball team will play 12 home games during the season. It has played 6 home games so far. Of the season's remaining games, $\frac{1}{3}$ will be played at home. The equation $\frac{1}{3}g + 6 = 12$ can be used to find the total number of games, g, remaining this season. How many games, g, remain in the season?

A. 6 games

B. 18 games

C. 24 games

D. 54 games

28) Pablo recorded the colors of cars driving by his house. The table below shows the colors of the last 250 cars to drive by Pablo's house.

Cars Driving By

Color	Number of Cars
blue	70
green	30
red	50
white	80
yellow	20

Using the data, what is the probability that the next car to drive by Pablo's house will be red or blue?

A. $\frac{5}{25}$

B. $\frac{7}{25}$

C. $\frac{12}{25}$

D. $\frac{13}{25}$

29) Working together, Ann and Jane tiled a total of 480 square feet in 3 hours. They each tiled the same number of square feet. What is the average rate that Ann and Jane each tiled in square feet per hour?

A. 80 square feet per hour

B. 160 square feet per hour

C. 240 square feet per hour

D. 720 square feet per hour

30) In a school with only sixth and seventh graders, $\frac{2}{5}$ of the 200 students are seventh graders.

A. How many students in the school are seventh graders?

B. Describe two different ways to determine how many students in the school are sixth graders.

C. Of the seventh graders, 30% are in the band. If the band has the same number of sixth graders as seventh graders, what percentage of the sixth graders are in the band? Explain how you found your answer.

31) A publishing company is going to have 24,000 books printed. There are between 3 and 4 books out of every 3,000 printed that will have a printing error. At this rate, which number could be the exact number of books that will have a printing error?

A. 7

B. 12

C. 31

D. 36

32) Amy knits $\frac{1}{10}$ of a scarf in $\frac{4}{5}$ of an hour. What fraction of a scarf can Amy knit in 1 hour?

A. $\frac{1}{5}$ of a scarf

B. $\frac{1}{8}$ of a scarf

C. $\frac{9}{10}$ of a scarf

D. $\frac{2}{25}$ of a scarf

33) Samantha is painting the outside of a box that is in the shape of a rectangular prism. Its length is 18 centimeters, its width is 6 centimeters, and its height is 3 centimeters. What is the surface area of the box in square centimeters (cm^2)?

A. 162 cm^2

B. 180 cm^2

C. 324 cm^2

D. 360 cm^2

34) Which unit rate is equivalent to $1\frac{3}{5}$?

A. the unit rate, in miles per minute, of running $\frac{1}{8}$ of a mile in $\frac{3}{5}$ of a minute

B. the unit rate, in pounds per day, of catching $\frac{4}{5}$ of a pound of fish in $\frac{1}{2}$ days

C. the unit rate, in baskets per hour, of washing 1 basket of laundry in $\frac{3}{5}$ of an hour

D. the unit rate, in trays per pound, of baking $\frac{5}{3}$ trays of cookies with $1\frac{3}{5}$ pounds of dough

35) Matty's piano book includes 15 songs in the key of C, 10 in the key of G, and 5 in the key of F. The songs from all three keys appear in random order. Over the past month, Matty has randomly opened his piano book to a song in the key of C 80 times, the key of G 30 times, and the key of F 10 times. What are the theoretical and experimental probabilities that the next song Matty randomly picks will be in the key of G?

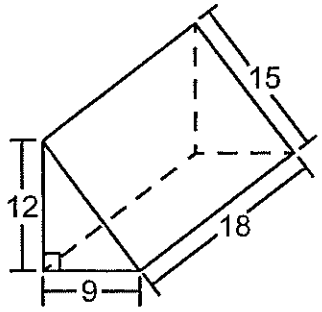
A. Theoretical probability = $\frac{1}{4}$ and experimental probability = $\frac{1}{3}$

B. Theoretical probability = $\frac{1}{2}$ and experimental probability = $\frac{1}{3}$

C. Theoretical probability = $\frac{1}{3}$ and experimental probability = $\frac{1}{2}$

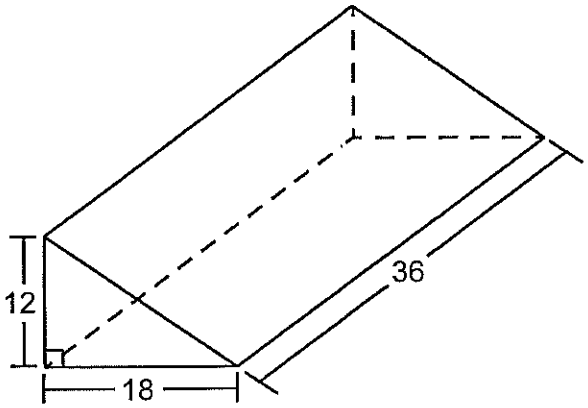
D. Theoretical probability = $\frac{1}{3}$ and experimental probability = $\frac{1}{4}$

Use the diagram below to answer the question.

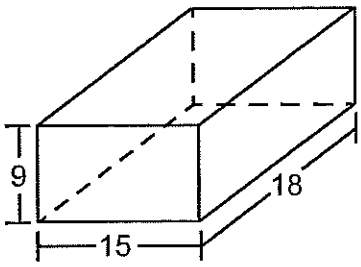


36) Which solid figure has exactly twice the volume, in cubic units, as the solid figure shown above?

A.



C.



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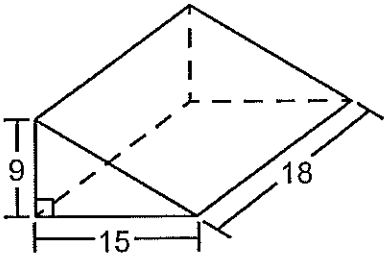
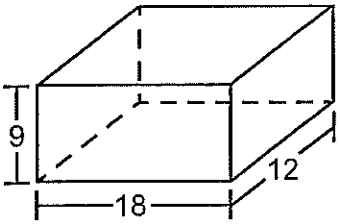


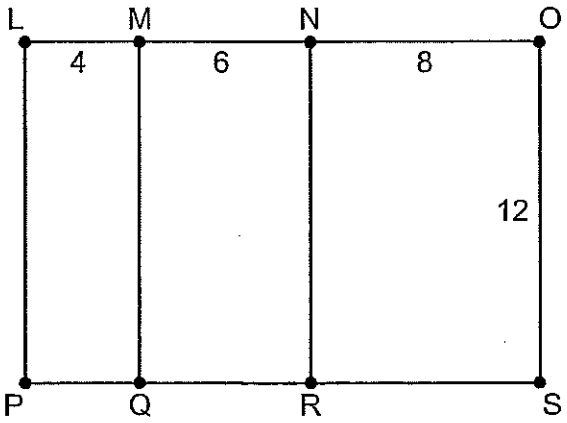
D.



37) Vincent bought a 25-pound bag of rice. He cooked 6.25 pounds of the rice. He stored the rest of the rice in $3\frac{3}{4}$-pound portions. What is the maximum number of $3\frac{3}{4}$-pound portions he stored?

A. 2.5
B. 3.4
C. 5.0
D. $6.\overline{6}$

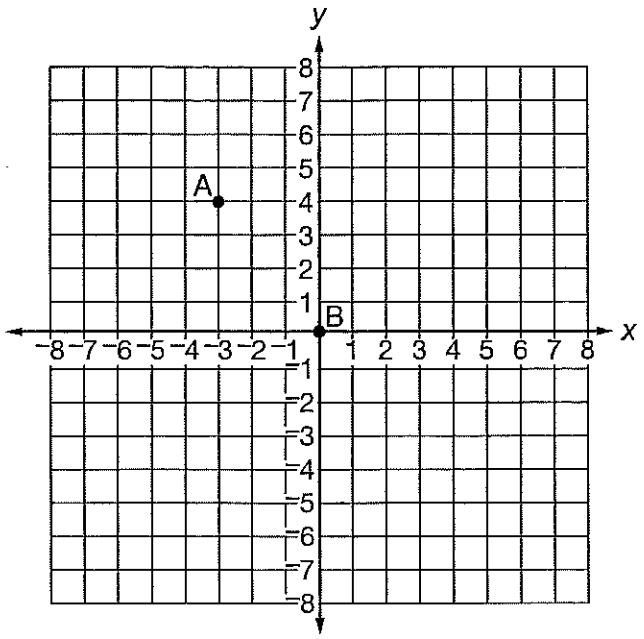
Rectangle LOSP is shown below. The lengths, in units, of some of the line segments are also shown. Line segments MQ and NR are perpendicular to line segment LO.



38) Which shape is similar to rectangle LOSP?

A. LMQP
B. LNRP
C. MNRQ
D. OSRN

Use the graph below to answer the question.



39) Which equation represents a line that passes through points A and B plotted on the graph?

A. $y = -\frac{4}{3}x$

B. $y = -\frac{3}{4}x$

C. $y = \frac{3}{4}x$

D. $y = \frac{4}{3}x$

40) Mr. Garcia needs at least 60 paintbrushes for his art classes. He has 22 paintbrushes already and will buy more paintbrushes in packages of 8. Which inequality can be used to find how many packages of paintbrushes, p, Mr. Garcia needs to buy in order to have at least 60 paintbrushes?

A. $8p - 22 \leq 60$

B. $8p - 22 \geq 60$

C. $8p + 22 \leq 60$

D. $8p + 22 \geq 60$

41) Which comparison is true?

A. $|-5\%| < \frac{1}{2}$

B. $-\frac{4}{9} > |37\%|$

C. $22\% < \left|-\frac{1}{5}\right|$

D. $49\% > \left|-\frac{5}{8}\right|$

42) Donna fed $\frac{1}{11}$ of the chickens at a farm. Which decimal is equal to the fraction of chickens Donna fed?

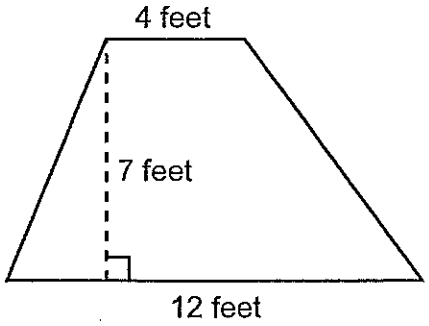
A. $0.\overline{09}$

B. $0.0\overline{9}$

C. $0.\overline{01}$

D. $0.0\overline{1}$

The top of a display counter at a store is in the shape of a trapezoid. The lengths of the front, back, and width, in feet, of the top of the display counter are shown below.



43) What is the area of the top of the display counter?

A. 30 square feet

B. 40 square feet

C. 56 square feet

D. 66 square feet

44) A box of sunflower seeds contains p packets. Each packet of sunflower seeds contains s seeds. Which equation can be used to find the number of sunflower seeds in a box, b?

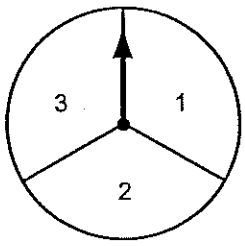
A. $p = sb$

B. $p = \frac{s}{b}$

C. $b = ps$

D. $b = \frac{p}{s}$

Ariana is playing a game. For each of her turns, she rolls a number cube labeled with the numbers 1 through 6. She also spins the spinner shown below.



45) To win the game Ariana needs to roll a 3 and spin a 3 on her next turn. What is the probability that Ariana will win the game on her next turn?

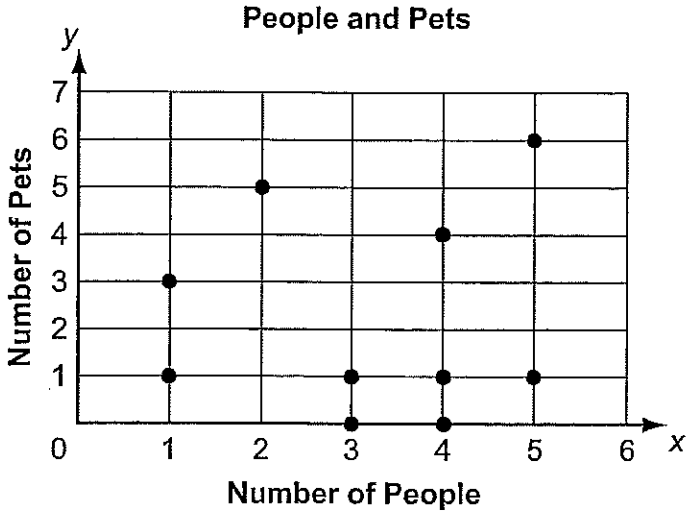
A. $\frac{1}{18}$

B. $\frac{1}{9}$

C. $\frac{1}{6}$

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

Misha asked ten different coworkers how many people and pets are living in their homes. She used the responses to create the scatter plot shown.



46) Which statement about the numbers of people and pets living in the homes of Misha's ten coworkers is true?

A. As the number of people living in the home increases, the number of pets increases.

B. As the number of people living in the home increases, the number of pets decreases.

C. As the number of people living in the home decreases, the number of pets decreases.

D. There is no relationship between the numbers of people and pets living in the home.

47) Which equation has infinitely many solutions?

A. $x = \frac{1}{4}x + \frac{3}{4}$

B. $\frac{1}{3}x - 5 = \frac{2}{3}x - 5$

C. $\frac{1}{2}(1 + 4x) = 2x - 3$

D. $3 - 4x = -6\left(\frac{2}{3}x - \frac{1}{2}\right)$

48) Tracy has \$35 to buy comic books and to pay for a movie ticket. Each comic book costs \$3. The movie ticket costs \$10. Which inequality can be used to determine how many comic books, b, Tracy can buy?

A. $35 - 3b \leq 10$

B. $35 - 3b \geq 10$

C. $35 - 10b \leq 3$

D. $35 - 10b \geq 3$

49) Which number is irrational?

A. $-\frac{4}{3}$

B. $\sqrt{121}$

C. 16.121314...

D. $0.00\overline{71}$

50) A roll of 40 quarters weighs 8 ounces. Which proportion can be used to find the weight in ounces, w, of 200 quarters?

A. $\frac{40}{8} = \frac{200}{w}$

B. $\frac{40}{w} = \frac{8}{200}$

C. $\frac{40}{200} = \frac{w}{8}$

D. $\frac{40}{8+w} = \frac{w}{200}$

51) The current temperature is –7°C. The high temperature yesterday was as many degrees above 0°C as the current temperature is below 0°C. Which expression could be used to find the number of degrees between the current temperature and yesterday's high temperature?

A. $0 - 7$

B. $-7 + 7$

C. $7 + 0$

D. $7 + 7$

52) Michael paid a total of $48 for 4 pizzas. He used a coupon for $4 off the entire order. The equation below can be used to determine the regular price of 1 pizza, p.

$$4p - 4 = 48$$

What is the regular price of 1 pizza?

A. $11

B. $12

C. $13

D. $16

53) Diana had a coupon for c dollars off of each box of crackers. Diana bought 2 boxes of crackers for $4.50 - c$ dollars each. She also bought 8 cans of soup for s dollars each. The total amount, in dollars, she spent on the cans of soup and boxes of crackers is represented by the expression below.

$$2(4.50 - c) + 8s$$

Which expression also represents the total amount, in dollars, she spent?

A. $6.50 - 2c + 8s$

B. $6.50 - 2c + 10s$

C. $9 - c + 8s$

D. $9 - 2c + 8s$

The table below represents the number of paintings, y, that Jordan completed in x years.

Jordan's Paintings

Year (x)	Paintings (y)
1	4
2	7
3	10
4	13

54) Which equation describes the relationship between the number of paintings and the year?

A. $y = x + 3$

B. $y = 3x + 1$

C. $y = 3x + 4$

D. $y = 4x + 3$

55) Which equation is true?

A. $\frac{5}{8} = -\left(\frac{-5}{-8}\right)$

B. $\frac{-3}{-4} = -\frac{3}{4}$

C. $-\left(\frac{12}{-17}\right) = \frac{12}{17}$

D. $\frac{9}{-13} = -\left(\frac{-9}{13}\right)$

Yvonne used 5 tablespoons of butter for a recipe. For a second recipe she used 10% less butter than she did for the first recipe. The total amount of butter, in tablespoons, she used for both recipes can be found using the expression below.

5 + 5 – 5(10%)

56) Which other expression can be used to find the amount of butter, in tablespoons, she used for both recipes?

A. $10 - 5\%$

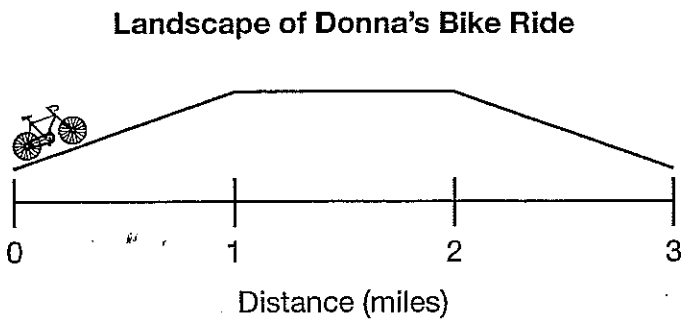
B. $10 - 50\%$

C. $5 + 5(0.9)$

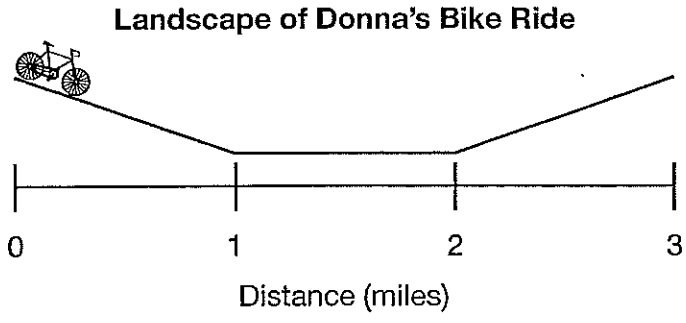
D. $5 + 5(1 - 10)$

57) Donna rode her bike for three miles. She traveled 18 miles per hour the first mile, 15 miles per hour the second mile, and 21 miles per hour the third mile. Which diagram shows the most likely landscape of Donna's bike ride?

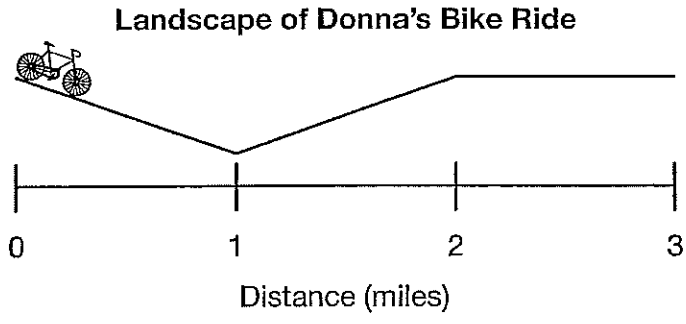
A.



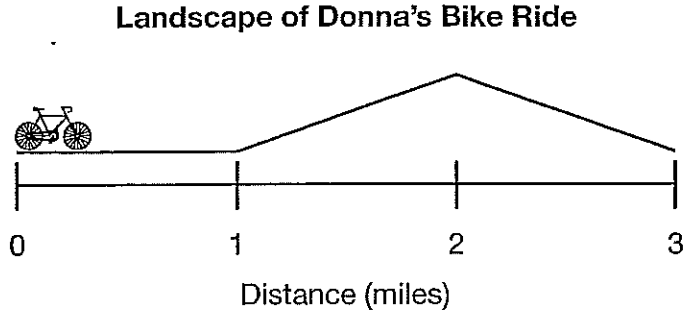
B.



C.



D.



58) At a hardware store the price of a rake, r, is one-third the price of a shovel, s. Which equation represents the relationship between the price of a rake and the price of a shovel?

A. $\frac{1}{3}r = s$

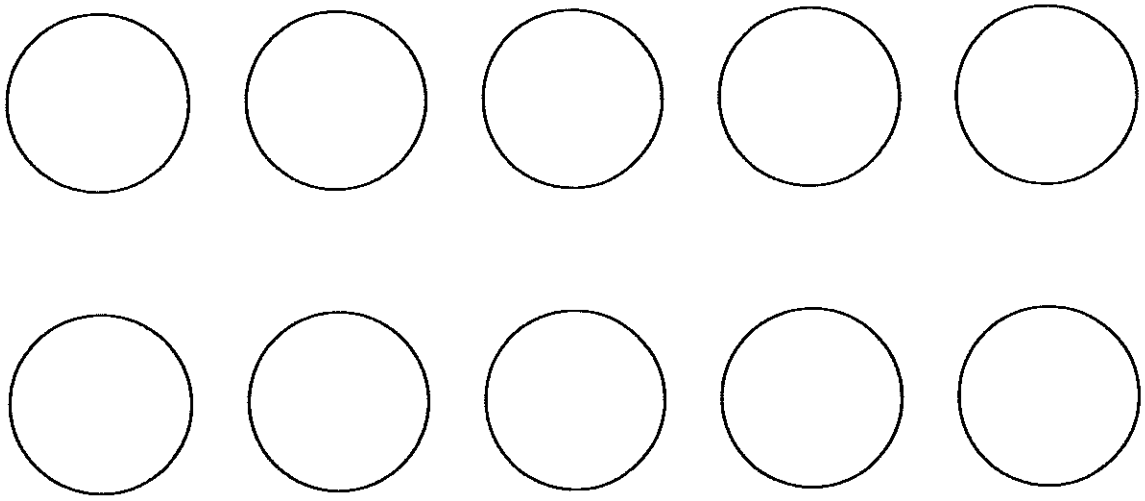
B. $3r = s$

C. $r = \frac{1}{3} + s$

D. $s = 3 + r$

59) Carl has 200 coins in a jar. Nickels make up 10% of the coins in the jar, and pennies make up 60% of the coins in the jar. All the coins in the jar are pennies, nickels, or dimes.

A. Inside each circle below, write 5¢ for nickel, 1¢ for penny, or 10¢ for dime so that the percentages of the pennies, nickels, and dimes match the percentages of pennies, nickels, and dimes in Carl's entire jar.



B. What is the ratio of dimes to pennies?

C. Carl adds 50 quarters to his jar. What effect does this have on the ratio of dimes to pennies? Explain your answer.

60) Buses from two different bus routes each stop at the same corner at 9 A.M. Buses from one route stop at that corner every 9 minutes. Buses from the other route stop there every 12 minutes. What is the fewest number of minutes that will pass until the next time buses from both routes are at that corner at the same time?

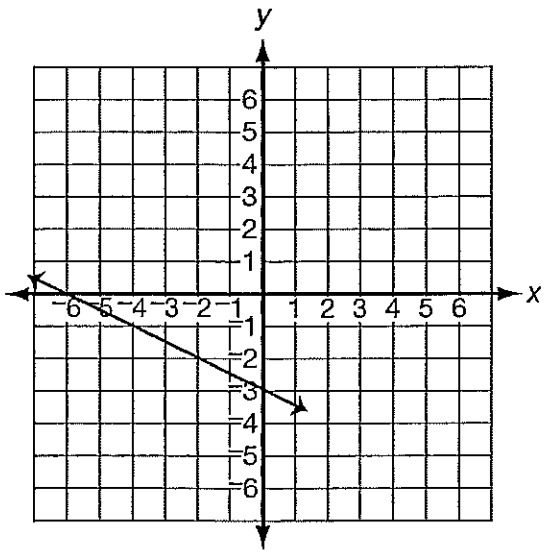
A. 21 minutes

B. 36 minutes

C. 54 minutes

D. 108 minutes

Use the graph below to answer the question.



61) Which equation has the same *y*-intercept as the line in the graph, and a slope that is the opposite of the slope in the graph?

A. $y = \frac{1}{2}x - 3$

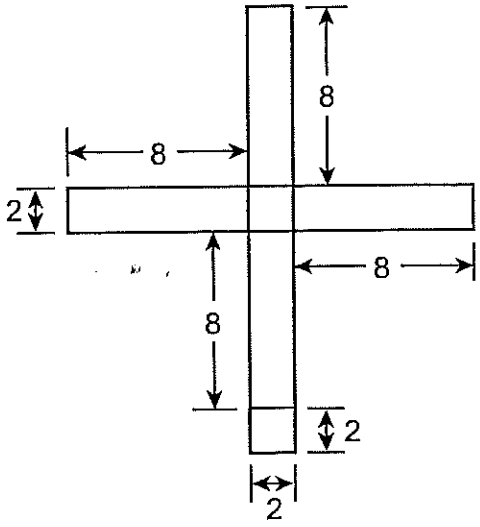
B. $y = \frac{1}{2}x + 3$

C. $y = -2x - 3$

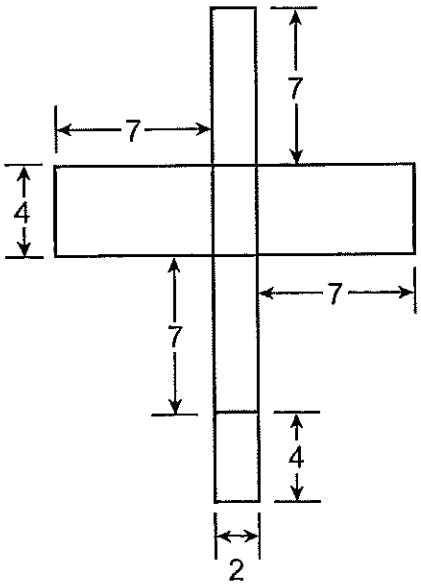
D. $y = 2x - 3$

62) Which diagram is of a net of a rectangular prism with a surface area of 78 square units?

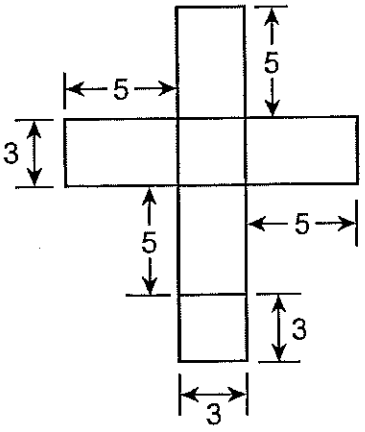
A.



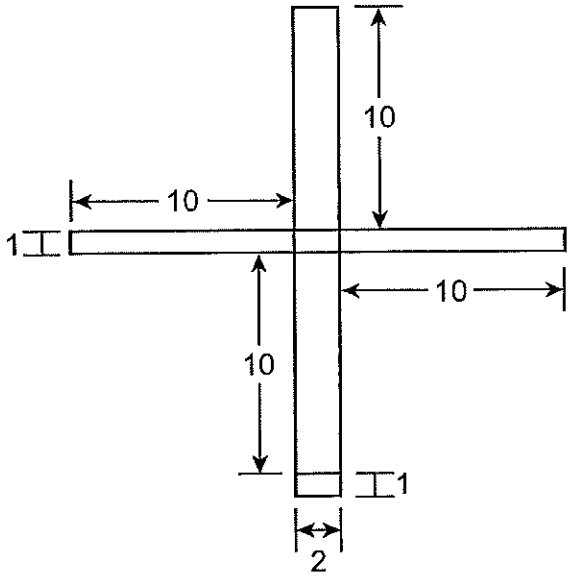
C.



B.



D.



63) What is 5×10^{-4} written in standard notation?

A. 0.00005

B. 0.0005

C. 5,000

D. 50,000

The table below represents the number of participants, y, on the Valley Middle School debate team after x years.

Debate Team

Year (x)	Number of Participants (y)
1	10
2	12
3	14
4	16
5	18

64) What is the relationship between the number of participants on the debate team and the year?

A. $y = x + 2$

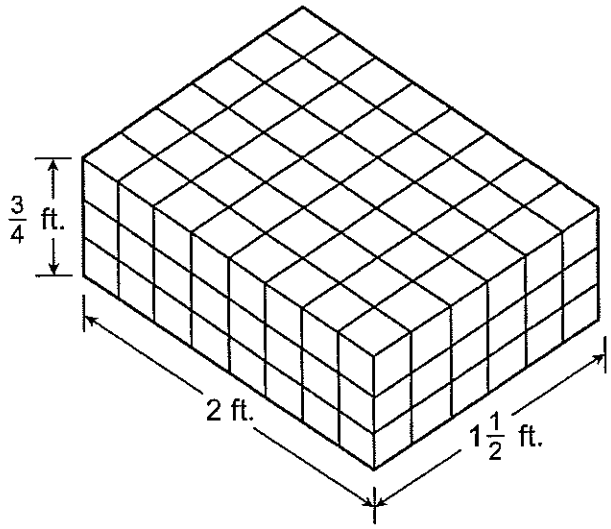
B. $y = 2x + 8$

C. $y = 2x + 10$

D. $y = 8x + 2$

Desireé has a stack of wood blocks. The edge length of each wood block is $\frac{1}{4}$ of a foot. The stack is in the shape of a rectangular prism as shown below.

Stack of Wood Blocks



65) What is the volume, in cubic feet, of the stack of wood blocks?

A. $1\frac{1}{3}$ cubic feet

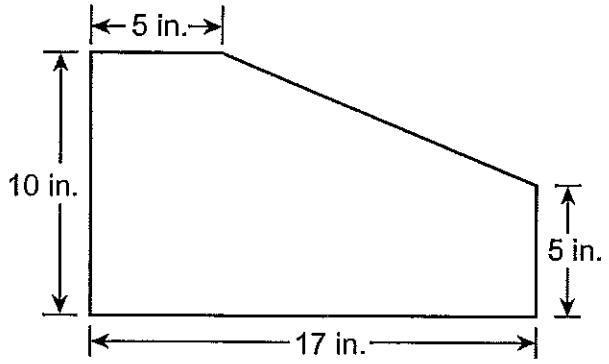
B. $2\frac{1}{4}$ cubic feet

C. $3\frac{3}{8}$ cubic feet

D. $4\frac{1}{4}$ cubic feet

Pascal had a rectangular piece of paper. He cut off a corner of the paper. The shape below is what was left.

Pascal's Paper



66) What is the area, in square inches, of the shape that was left?

A. 50 square inches

B. 110 square inches

C. 140 square inches

D. 170 square inches

67) Consider the family of linear equations of the form shown below, where z is a rational number.

$$\frac{2}{3}(3x + 2) = zx$$

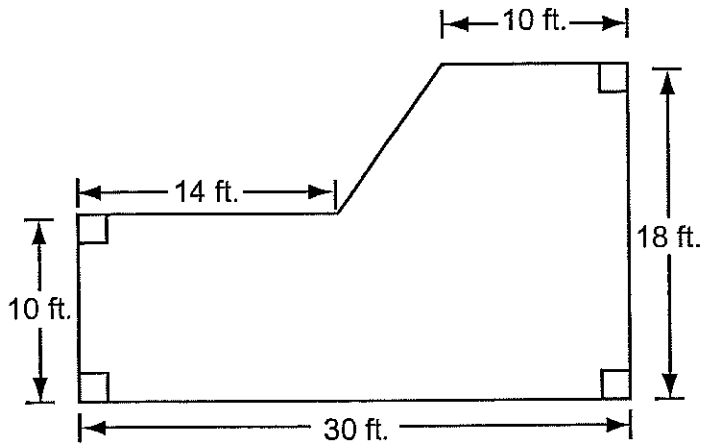
A. Solve the equation when $z = 1$.

B. Find a value for z such that the equation has no solution. Explain how you know the equation has no solution for the value of z you specified.

C. Using what you know about constants and coefficients, explain why there is **no** value of z that will force the equation to have infinitely many solutions.

The figure below shows a diagram of Laura's front porch.

Laura's Front Porch



68) What is the area of Laura's front porch?

A. 380 square feet

B. 404 square feet

C. 428 square feet

D. 540 square feet

69) There are d dogs that live in Stacy's neighborhood. There are 3 times as many cats, c, that live in her neighborhood as dogs. In Stacy's neighborhood there are 18 cats. Which statement about this situation is true?

A. The situation can be represented by the equation $3c = d$; therefore, since there are 18 cats there are also 6 dogs.

B. The situation can be represented by the equation $3c = d$; therefore, since there are 18 cats there are also 54 dogs.

C. The situation can be represented by the equation $3d = c$; therefore, since there are 18 cats there are also 6 dogs.

D. The situation can be represented by the equation $3d = c$; therefore, since there are 18 cats there are also 54 dogs.

70) Camille placed blocks on a table in rows and columns. All the rows and columns had the same number of blocks in them and formed a square. Which could be the total number of blocks Camille placed on the table?

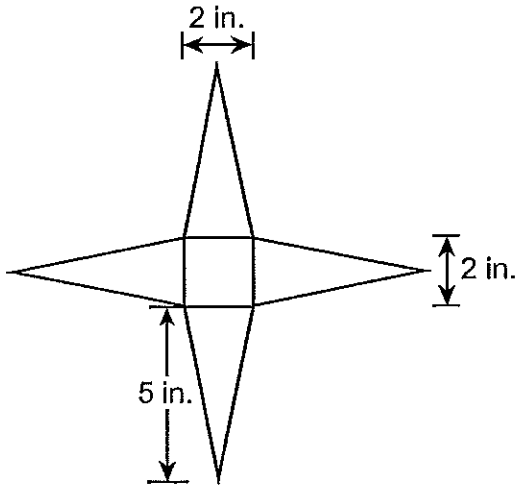
A. 111 blocks

B. 121 blocks

C. 181 blocks

D. 222 blocks

Will is making a square pyramid out of cardboard. He drew a diagram of the square pyramid he is making as shown below.



71) Based on Will's diagram, how many square inches of cardboard make up his square pyramid?

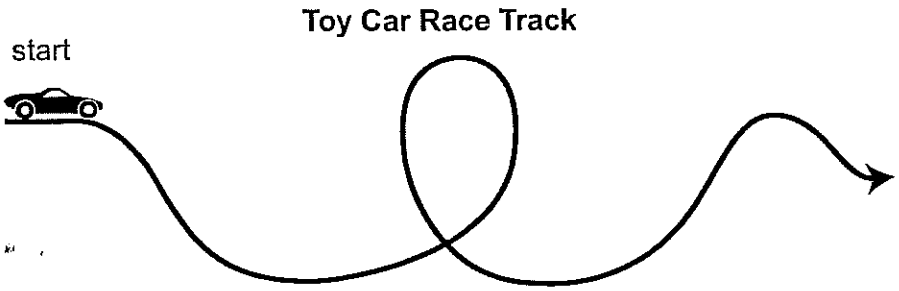
A. 9 square inches

B. 20 square inches

C. 24 square inches

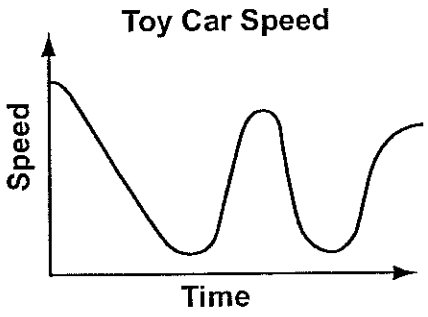
D. 28 square inches

Use the picture to answer the question below.

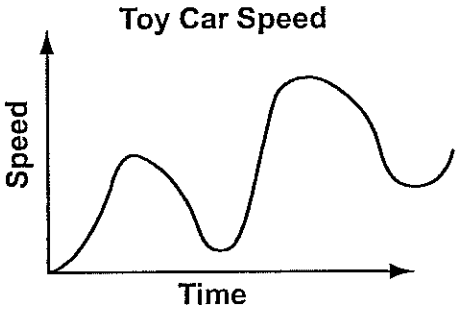


72) The picture shows the beginning of a racetrack for a toy car. Which graph models the estimated speed of the toy car as it moves through the racetrack?

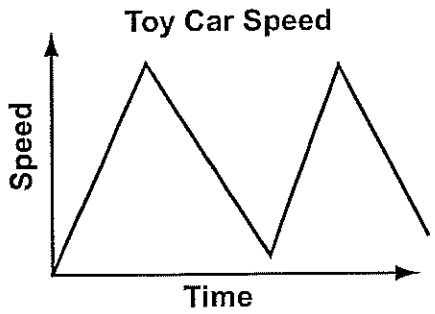
A.



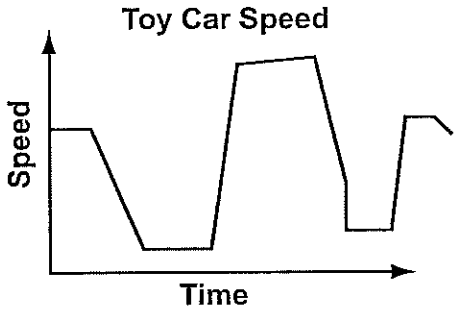
B.



C.



D.



73) The United States exported approximately 30,000,000 metric tons of wheat over an entire year. What is the number of metric tons of wheat written in scientific notation?

A. 3×10^4

B. 3×10^5

C. 3×10^6

D. 3×10^7

A water cooler has 4.2 gallons of water in it. Simon spills 0.25 of a gallon of the water. He uses the expression below to find how many gallons of water are remaining in the water cooler.

4.2 – 0.25

74) How many gallons of water are remaining in the water cooler?

A. 1.7 gallons

B. 3.05 gallons

C. 3.95 gallons

D. 4.05 gallons

75) The algebraic expression $6x^2 + 9x + 3$ represents the area of a rectangle. What is the area of the rectangle when $x = 3$ feet?

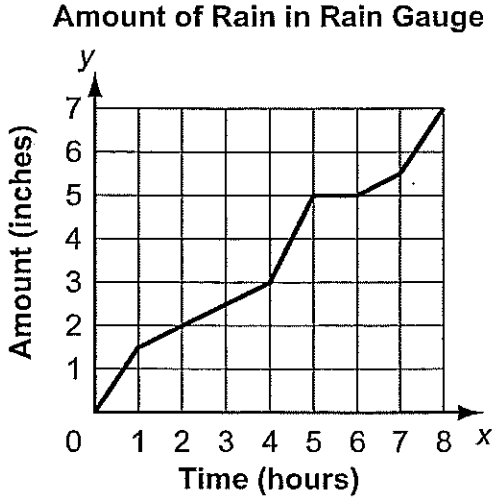
A. 51 square feet

B. 60 square feet

C. 66 square feet

D. 84 square feet

A weather station recorded the amount of rain that fell during an 8-hour time frame using a rain gauge. The findings are recorded in the graph below.



76) Between which hours was the rate at which the rain fell **greater** than the rate at which the rain fell between hours 0 and 1?

A. between hours 1 and 4

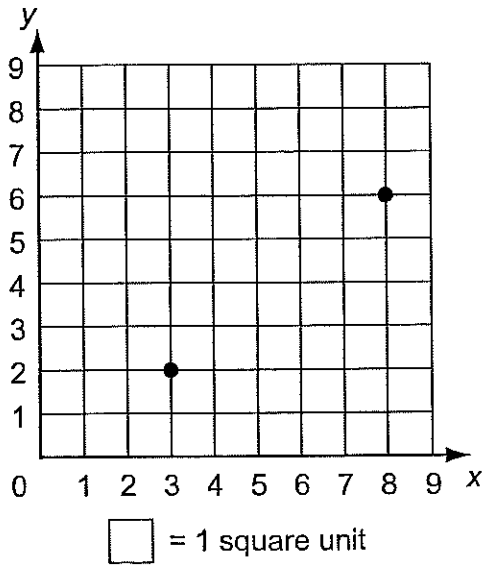
B. between hours 4 and 5

C. between hours 5 and 6

D. between hours 7 and 8

Ingrid used the coordinate grid shown below to plot her rectangular garden.

Ingrid's Garden



77) A corner of the garden is at (3, 2) and the opposite corner is at (8, 6). In square units, what is the area of Ingrid's garden?

A. 4 square units

B. 5 square units

C. 18 square units

D. 20 square units

Use the expression below to answer the question.

$$4(2x + 10y)$$

78) Which expression is equivalent to the one shown?

A. $8(x + 5y)$

B. $8x + 10y$

C. $8(x + 10y)$

D. $8x + 14y$

79) Tanya does push-ups and sit-ups every morning. She does p push-ups and $2p + 5$ sit-ups. Which statement describes the number of sit-ups Tanya does every morning?

A. The number of sit-ups is 5 fewer than half the number of push-ups she does.

B. The number of sit-ups is 5 more than half the number of push-ups she does.

C. The number of sit-ups is 5 fewer than twice the number of push-ups she does.

D. The number of sit-ups is 5 more than twice the number of push-ups she does.

Use the two functions below to answer the question.

Function A

$$y = \frac{1}{4}x - \frac{2}{3}$$

Function B

x	y
2	−8
4	−9
6	−10
8	−11

80) Which statement about the slopes of the functions is true?

A. The slopes of both functions are negative.

B. The slopes of both functions are positive.

C. The slope of function A is negative and the slope of function B is positive.

D. The slope of function A is positive and the slope of function B is negative.

A restaurant sold h hamburgers yesterday. The number of cheeseburgers sold yesterday is represented by the expression below.

$$\mathbf{6}h - \mathbf{21}$$

81) Which other expression also shows how many cheeseburgers were sold yesterday?

A. $(h - 21) + 5h$

B. $3(3h - 18)$

C. $6 + (h - 21)$

D. $3(2 - 7) \times h$

A group of four friends each mowed lawns after school and on the weekends for a month. The total number of lawns mowed can be represented by the equation below.

$$x + \frac{1}{3}x + \frac{1}{2}x + 16 = 49$$

82) Each friend is represented by a term in the equation. How many lawns, x, did the first friend mow?

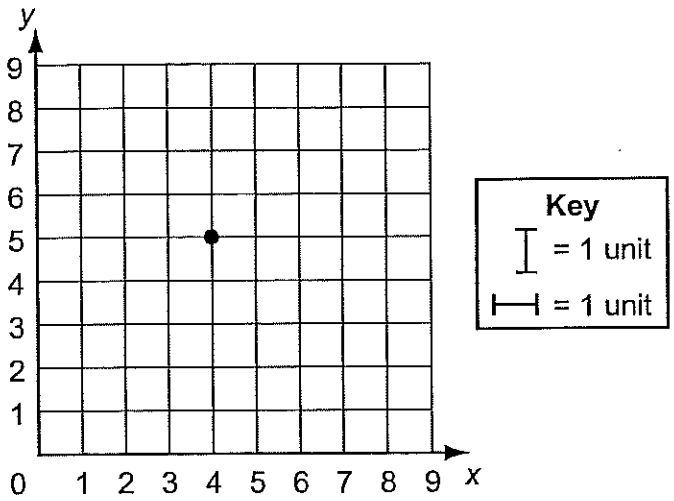
A. 11

B. 18

C. 27

D. $31\frac{1}{6}$

A construction worker is using the coordinate grid below to show the length of a wall inside a house.



83) One end of the wall will be at (4, 5). The wall will be 4 units long. Which point could be the location of the other end of the wall?

A. (0, 5)

B. (4, 4)

C. (5, 0)

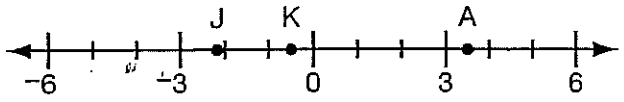
D. (8, 9)

Amanda, Javier, and Kris each measure the change in their hair lengths over a year.

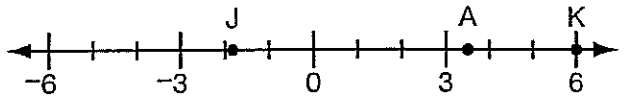
- Amanda's hair length (A) is 3.4 inches longer than last year.
- Javier's hair length (J) is 2.1 inches shorter than last year.
- Kris's hair length (K) is 0.6 inches shorter than last year.

84) Which number line **best** represents the changes in hair lengths of each person using points A, J, and K?

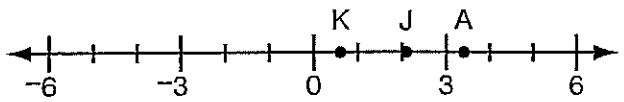
A.



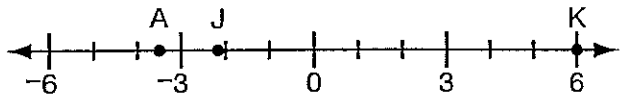
B.



C.



D.



85) Which is a pair of equal expressions?

A. $9y + 6$ and $6y + 9$

B. $7x - 3$ and $3 - 7x$

C. $2y \times 4$ and $2 \times 4y$

D. $5x - 10$ and $5(2 - x)$

Karen and Henry each sold food at the fair. The table below shows the total number of corn dogs Karen sold at different times of the day.

Karen's Corn Dog Sales

Time	Total Corn Dogs Sold
12:00 P.M.	42
2:00 P.M.	56
4:00 P.M.	70
6:00 P.M.	84

86) Henry uses the equation below to show the number of hot dogs, h, he has sold after t hours.

$$h = 14t$$

Which statement about Karen and Henry is true?

A. The rate that Henry sells hot dogs is half the rate that Karen sells corn dogs.

B. The rate that Henry sells hot dogs is double the rate that Karen sells corn dogs.

C. The rate that Karen sells corn dogs is 7 times the rate that Henry sells hot dogs.

D. The rate that Karen sells corn dogs is the same as the rate that Henry sells hot dogs.

87) Olivia and Ray walk to school. Olivia walks $\frac{1}{4}$ of a mile to school. Her walk is $\frac{2}{3}$ of the distance that Ray walks to school. What is the total distance, in miles, that Ray walks to school?

A. $\frac{1}{6}$ of a mile

B. $\frac{3}{8}$ of a mile

C. $\frac{5}{12}$ of a mile

D. $\frac{11}{12}$ of a mile

A box of cookies costs $4. Freeman has $34. The inequality below can be used to find the numbers of boxes of cookies, x, Freeman can buy with $34.

$$4x \leq 34$$

88) Which statement describes all the possible numbers of boxes of cookies Freeman can buy with $34?

A. He can buy 8 boxes of cookies or fewer.

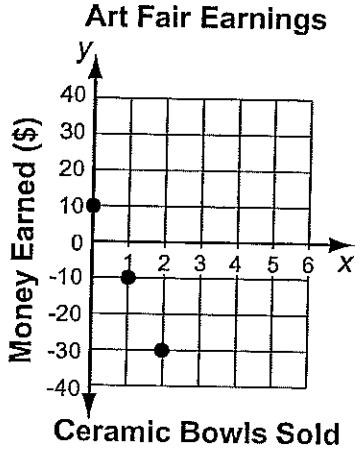
B. He can buy 9 boxes of cookies or fewer.

C. He can buy 30 boxes of cookies or fewer.

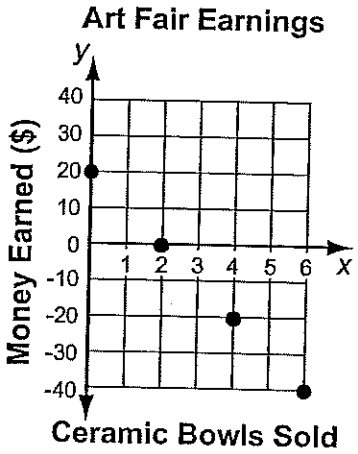
D. He can buy 38 boxes of cookies or fewer.

89) Ayan paid a $20 fee for a booth at an art fair so she could sell her ceramic bowls. She will earn $10 for every ceramic bowl she sells. The equation $y = 10x - 20$ represents the amount of money, y, that Ayan will earn selling x ceramic bowls at the art fair. Which graph represents the amount of money Ayan could earn at the art fair?

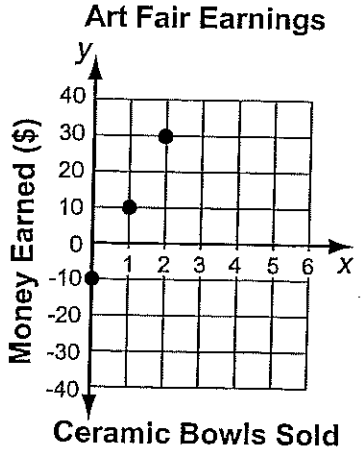
A.



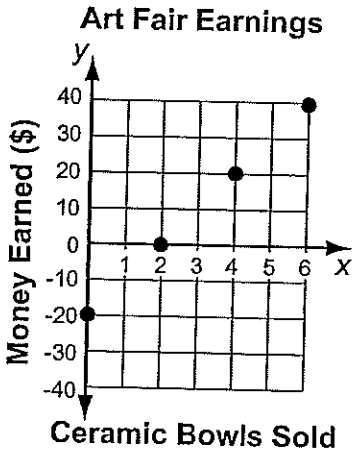
B.



C.



D.



90) In Xavier's coin collection, $\frac{1}{5}$ of the coins are pennies, $\frac{11}{40}$ of the coins are nickels, and $\frac{1}{4}$ of the coins are dimes. Which list correctly compares these portions of Xavier's coin collection?

A. $\frac{1}{4} < \frac{1}{5} < \frac{11}{40}$

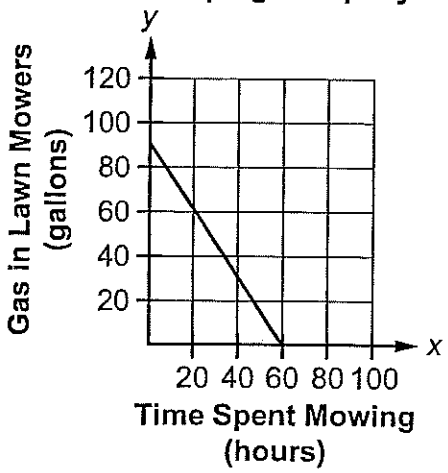
B. $\frac{1}{5} < \frac{1}{4} < \frac{11}{40}$

C. $\frac{1}{5} < \frac{11}{40} < \frac{1}{4}$

D. $\frac{11}{40} < \frac{1}{5} < \frac{1}{4}$

The graph and table below show information about two landscaping companies.

Landscaping Company A



Landscaping Company B

Time Spent Mowing (hours)	Gas in Lawn Mowers (gallons)
0	110
24	80
48	50
72	20
88	0

91) Which statement about the two landscaping companies is true?

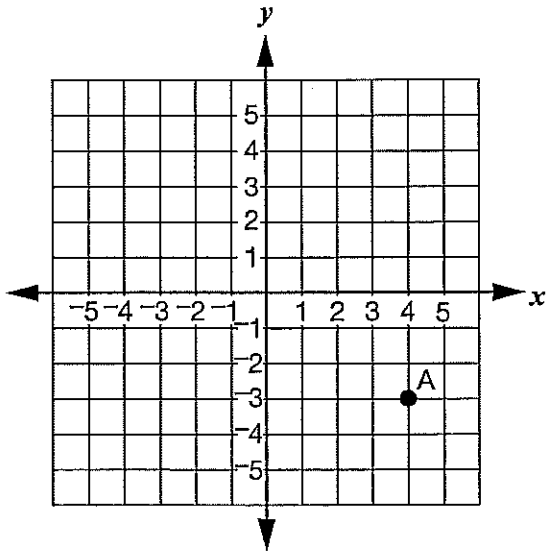
A. Landscaping company A mows for 20 more hours than landscaping company B.

B. Landscaping company B mows for 20 more hours than landscaping company A.

C. Landscaping company A uses 0.25 of a gallon more gasoline per hour than landscaping company B.

D. Landscaping company B uses 0.25 of a gallon more gasoline per hour than landscaping company A.

Alessandro plotted point A on the coordinate grid below.



92) He reflected point A across one of the axes to create point B. Which ordered pair could be the location of point B?

A. (−3, −4)

B. (−4, 3)

C. (4, −3)

D. (4, 3)

Charlotte invested $100 per year into a business for 3 years. The total value of her investment after 3 years is represented by the algebraic expression below, where x is the growth in value each year.

$$100(x^3 + x^2 + x)$$

93) What is the total value of her investment when $x = 2$?

A. $600

B. $1200

C. $1400

D. $6400

94) What is the solution to the equation $\frac{1}{3}(x + 2) = \frac{2}{3}x + 4$?

A. $x = -10$

B. $x = -3$

C. $x = 6$

D. $x = 12$

95) A company puts 36 cans into each box they send to a store. Each can has a radius of 1.5 inches and a height of 6 inches. What is the approximate total volume, in cubic inches, of the cans in each box the company sends to a store? Use 3.14 for π.

A. 42.39 cubic inches

B. 56.25 cubic inches

C. 1,526.04 cubic inches

D. 2,034.72 cubic inches

96) The bottom of a swimming pool is 10 feet below the surface of the water in the pool. The surface of the water is represented by the number 0, and the bottom of the pool is represented by the number –10. The pool's diving board is the same distance above the surface of the water as the bottom of the pool is below the surface of the water. What number represents the location of the diving board?

A. $\frac{1}{10}$

B. 0

C. 10

D. 20

Use the equation below to answer the question.

$$6x + 3 = 3(2x + 3)$$

97) Which statement correctly explains whether the equation is true or not?

A. It is true because $6x$ equals $3 \times 2x$.

B. It is not true because 3×3 does not equal 3.

C. It is true because the terms on the left are multiples of 3.

D. It is not true because all the x values should be on the same side of the equation.

Sheila put a new lightbulb into a light socket. The lightbulb was on for 24 hours a day and burned out after 1,806 hours. Sheila did the work below to determine how many days the lightbulb lasted.

$$\begin{array}{r} 75 \\ 24\overline{)1{,}806} \\ -168\downarrow \\ \hline 126 \\ -120 \\ \hline 6 \end{array}$$

98) Sheila needs to finish the calculation to find how long, in days, the lightbulb lasted. Which statement about Sheila's calculations is true?

A. Sheila completed the calculation by subtracting $24 - 6$ to get 18 and found that the lightbulb lasted 75.18 days.

B. Sheila completed the calculation by dividing $6 \div 24$ to get 0.25 and found that the lightbulb lasted 75.25 days.

C. Sheila completed the calculation by dividing $24 \div 6$ to get 4 and found that the lightbulb lasted 75.4 days.

D. Sheila completed the calculation by adding on 0.6 of a day since the remainder is 6 and found that the lightbulb lasted 75.6 days.

99) The choir director set up chairs for the concert with an equal number of rows and columns. The number of chairs in each row and column is represented by the algebraic expression $\sqrt{y}$, where y is the total number of chairs. What is the number of chairs in each row and column if $y = 81$ chairs?

A. 3 chairs

B. 9 chairs

C. 40.5 chairs

D. 162 chairs

The change, in yards, in a football team's position on the field for each of their last four plays is shown below.

$$-4, 7, -7, 0$$

100) Which list correctly compares the changes, in yards, in the football team's position on the field?

A. $-7 < -4 < 0 < 7$

B. $-4 < -7 < 0 < 7$

C. $0 < -7 < -4 < 7$

D. $0 < -4 < -7 < 7$