

Mathematics Chart

LENGTH

Metric

1 kilometer = 1000 meters

1 meter = 100 centimeters

1 centimeter = 10 millimeters

Customary

1 mile = 1760 yards

1 mile = 5280 feet

1 yard = 3 feet

1 foot = 12 inches

CAPACITY AND VOLUME

Metric

1 liter = 1000 milliliters

Customary

1 gallon = 4 quarts

1 gallon = 128 ounces

1 quart = 2 pints

1 pint = 2 cups

1 cup = 8 ounces

MASS AND WEIGHT

Metric

1 kilogram = 1000 grams

1 gram = 1000 milligrams

Customary

1 ton = 2000 pounds

1 pound = 16 ounces

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Metric and customary rulers can be found on the separate Mathematics Chart.

Continued on the next page

Mathematics Chart

Perimeter	square	$P = 4s$
	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	square	$A = s^2$
	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
Surface Area	cube	$S = 6s^2$
	cylinder (lateral)	$S = 2\pi rh$
	cylinder (total)	$S = 2\pi rh + 2\pi r^2$ or $S = 2\pi r(h + r)$
	cone (lateral)	$S = \pi rl$
	cone (total)	$S = \pi rl + \pi r^2$ or $S = \pi r(l + r)$
	sphere	$S = 4\pi r^2$
Volume	prism	$V = Bh^*$
	cylinder	$V = Bh^*$
	pyramid	$V = \frac{1}{3}Bh^*$
	cone	$V = \frac{1}{3}Bh^*$
	sphere	$V = \frac{4}{3}\pi r^3$
<i>*B represents the area of the Base of a solid figure.</i>		
Pi	π	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Pythagorean Theorem		$a^2 + b^2 = c^2$
Simple Interest Formula		$I = prt$

DIRECTIONS

Read each question. Then fill in the correct answer on your answer document.

SAMPLE A

Find the **greatest common factor** of 12 and 18.

Greatest common factor: the largest number that ALL the given numbers can be divided by.

- A** 3
- B** 6
- C** 9

SAMPLE B

Find the **perimeter** of this square rug in meters.

Perimeter (P): the distance around the edge of an image.

Perimeter of a square:
 $P = 4s$ ($s = \text{side}$)



3.2 m

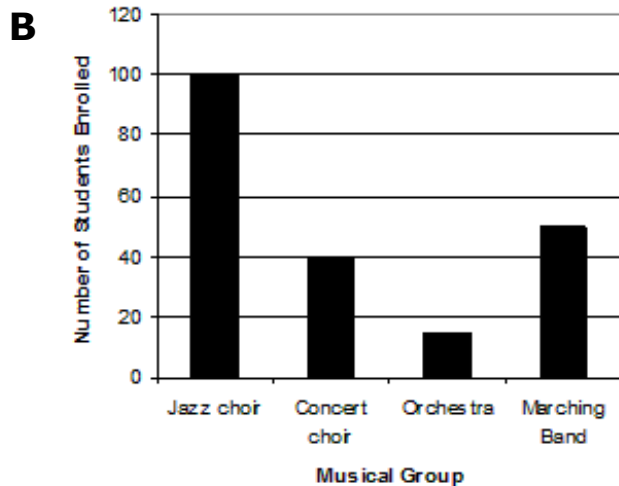
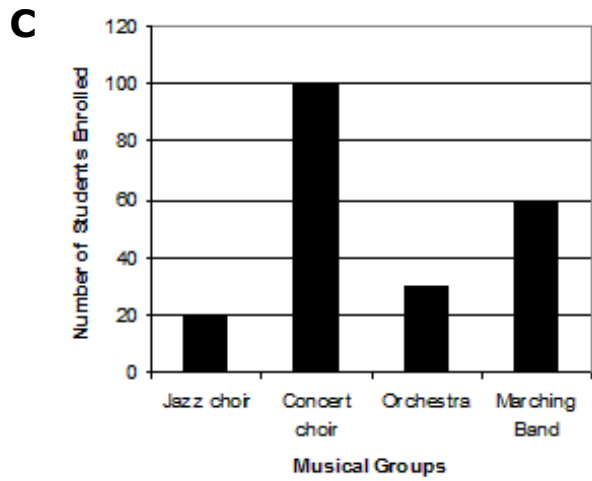
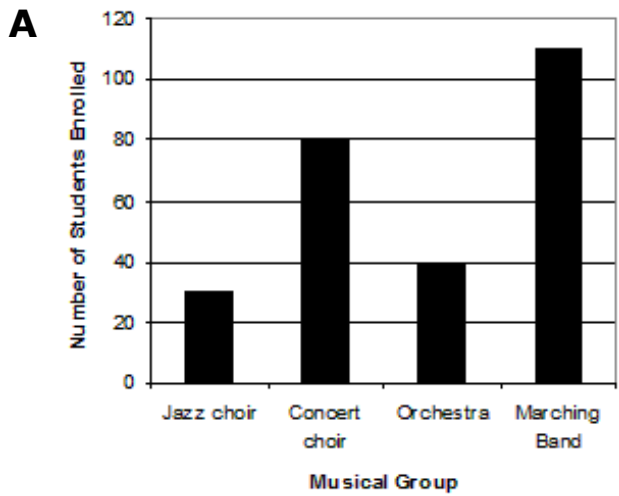
- F** 12.8m
- G** 6.6m
- H** 5 m



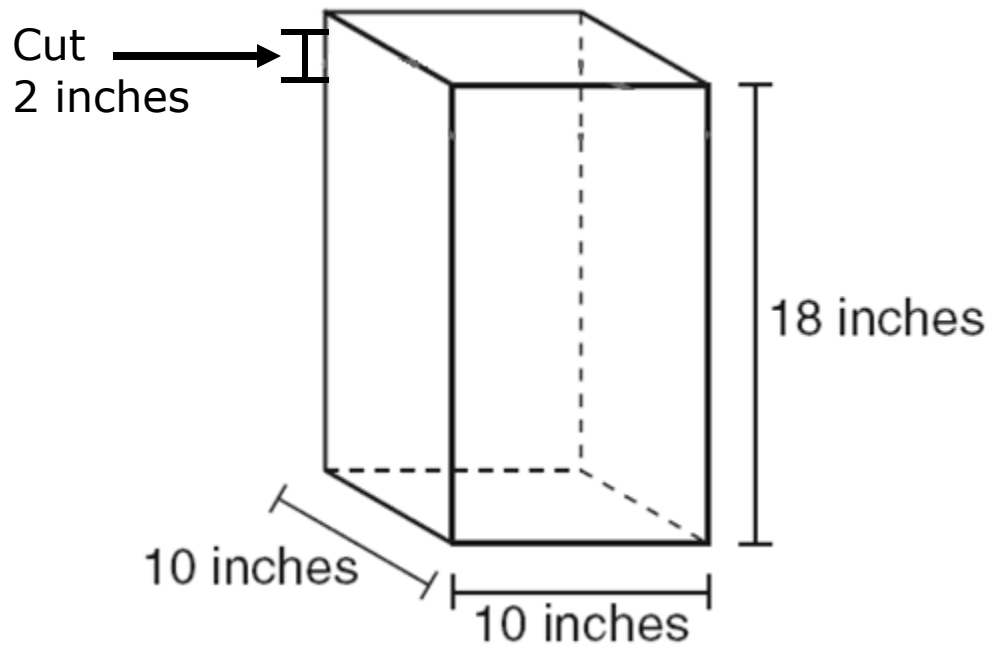
1. The table below shows the number of students in 7th and 8th grades who are enrolled in different musical groups.

Musical Groups		
Group	7 th grade	8 th grade
Jazz Choir	12	18
Concert Choir	34	46
Orchestra	16	24
Marching Band	50	60

Which graph best represents the data in the table?



2. Look at the rectangular box below.



If Deb cuts off a 2-inch strip around the top of the box, what will be the new **volume** of the box in cubic inches?

<p>Volume (V) $V = \text{length} \times \text{width} \times \text{height}$</p>
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- F** 1,600 in.³
- G** 800 in.³
- H** 5,000 in.³



3. The students in Mr. Lee's science class are ordering the materials they will need for a science experiment. Each student will need materials that cost \$3.50.

If x represents the number of students in Mr. Lee's science class, which equation can be used to find y , the amount in dollars spent by Mr. Lee's students?

A $y = x + 3.5$

B $y = 3.5x$

C $y = x + 2.5$



4. The table shows the population of Texas from 1900 to 2000.

Texas Population

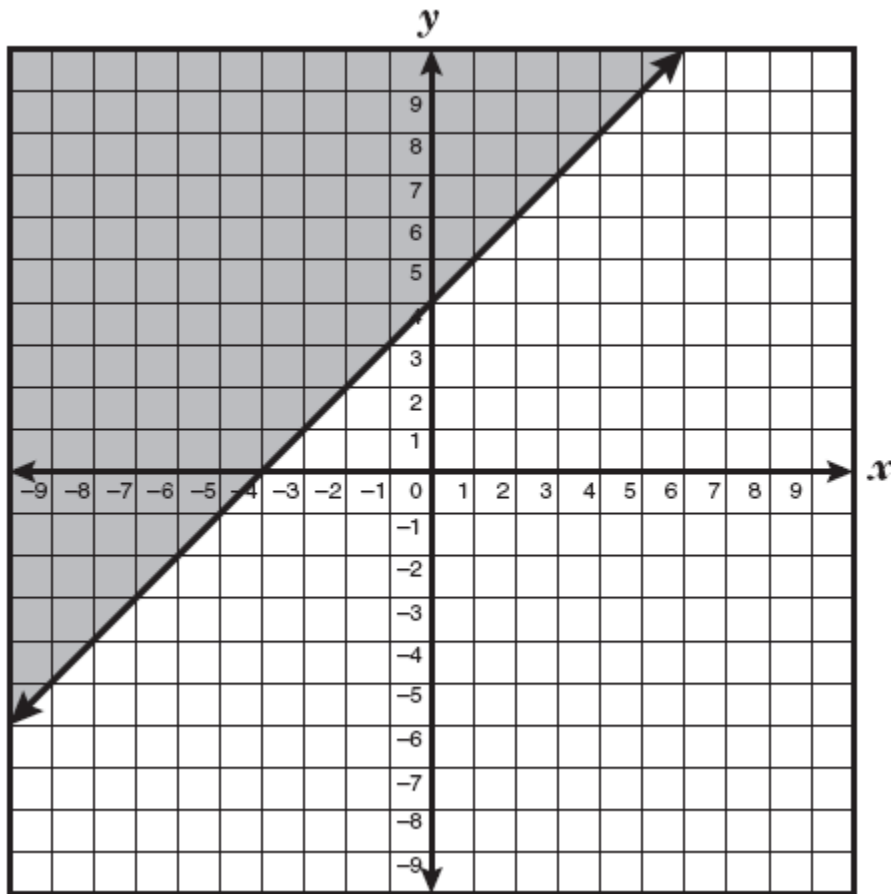
Year	Population (thousands)
1950	7,711
1960	9,580
1970	11,197
1980	14,229
1990	16,987
2000	20,852

Which of the following is true, based on the data above?

- F** The population of Texas in 1990 was 4 times the population in 1950.
- G** The population of Texas tripled from 1980 to 2000.
- H** The population of Texas more than doubled from 1960 to 2000.



5. Mrs. Wells drew a line and shaded part of the coordinate plane.



Which list is made up of coordinate pairs representing points in the shaded part of the coordinate plane?

- A** $(3, -4)$, $(-2, 5)$, and $(6, -3)$
- B** $(-3, 4)$, $(3, 8)$, and $(-9, -2)$
- C** $(-3, 5)$, $(3, 1)$, and $(-9, 2)$



6. Joe used the rule listed below to rewrite the expression $10^2 \times 10^5$.

$$\mathbf{10}^m \times \mathbf{10}^n = \mathbf{10}^{m+n}$$

Based on this rule, which of these is correct?

F 8^{-10} , because $8^{-4} \times 8^6 = 8^{10}$

G 8^2 , because $8^{-4} \times 8^6 = 8^2$

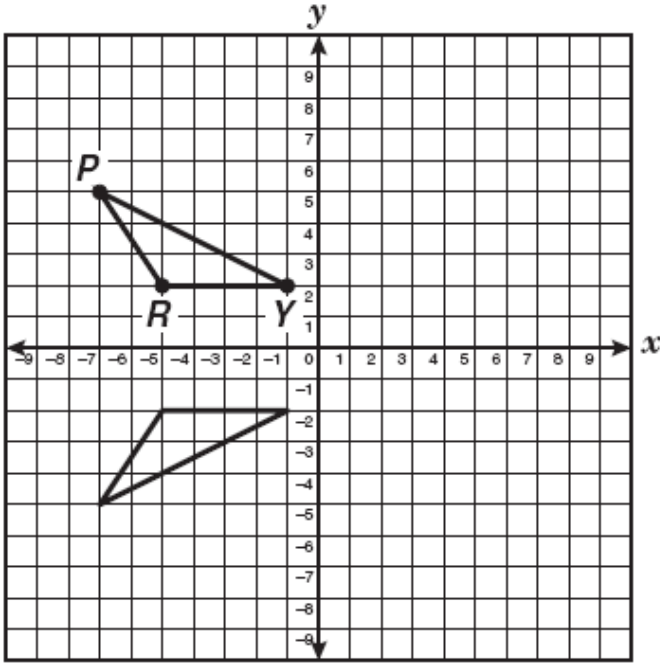
H 8^{10} , because $8^{-4} \times 8^6 = 8^{16}$



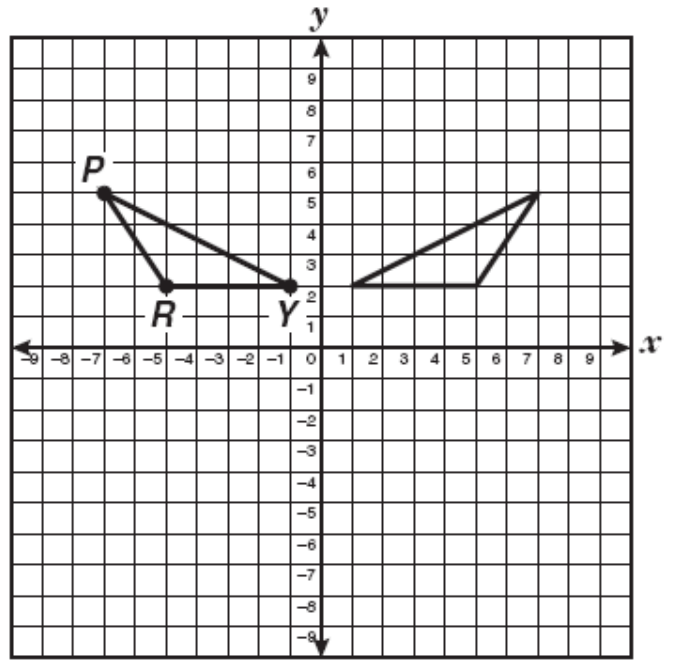
7. $\triangle PRY$ is **reflected** across the y-axis. Which of the following shows this transformation?

Reflected: one image across from another to make a mirror view.

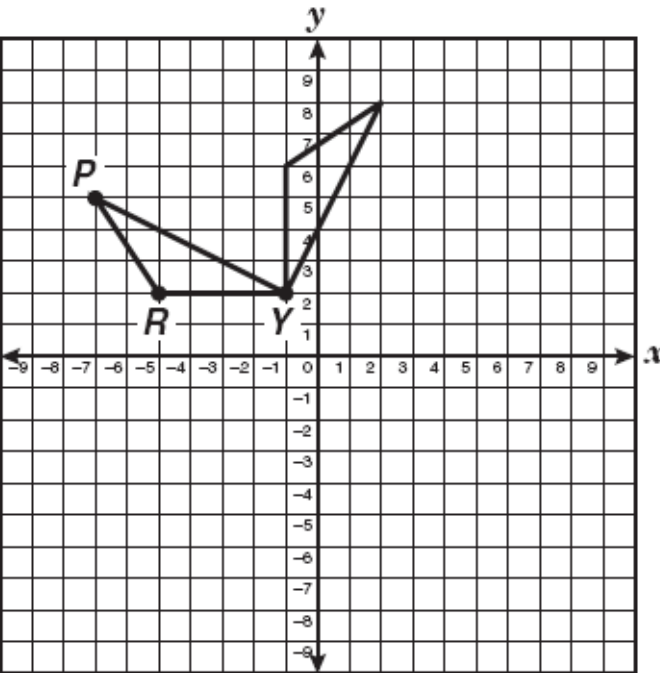
A



C



B



8. A set of parentheses is missing from the expression below.

$$15 - 5 + 7 \cdot 2 + 4$$

Which of the following expressions has the parentheses in the correct place for the expression to equal 52?

F $15 - (5 + 7 \cdot 2 + 4)$

G $15 - (5 + 7 \cdot 2) + 4$

H $15 - 5 + 7 \cdot (2 + 4)$



9. The table shows n , the number of sides of a **polygon**, and S , the sum of the measures of the interior angles of that polygon.

Polygon: a shape with 3 or more sides

Polygon

Number of Sides, n	Sum of Interior Angle Measures, S
3	180°
4	360°
5	540°
6	720°
7	900°

Based on the table, which statement is true?

- A** The sum of the interior angle measures doubles for each side increase of 1.
- B** The sum of the interior angle measures increases by 180° for each side increase of 1.
- C** The sum of the interior angle measures decreases by 100° for each side increase of 1.



10. Look at the sequence in the table below.

Position	Value of Term
1	2.5
2	3.5
3	4.5
4	5.5
5	6.5
n	

Which expression can be used to find the value of the term in the n th position?

F $\frac{3n}{2}$

G $\frac{n}{2}$

H $n + 1.5$



11. A recipe for 12 waffles calls for $1\frac{1}{2}$ cups of milk, 2 cups of flour, and 1 cup of other ingredients. How many cups of milk, flour, and other ingredients are needed to make 36 waffles?

- A** 10 cups
- B** $13\frac{1}{2}$ cups
- C** 5 cups



12. Ray packs boxes for an appliance company. He can pack a large box in 10 minutes and a small box in 4 minutes.

How long will it take him to pack 10 large boxes and 20 small boxes?

Large box = 10 minutes
Small box = 4 minutes

1 hour = 60 minutes

- F** 3 hours
- G** 45 minutes
- H** 7 hours



13. Which expression represents the number 213.7 in scientific notation?

A 2.137×10^2

B 2137×10^7

C 213.7×10^4

14. Mrs. Green bought 3 table lamps for \$129.90. If the lamps cost \$120.00 before tax was added, what tax rate did she pay on the 3 lamps?

F 30.79%

G 8.25%

H 43.3%



15. A water tank contains 2,500 gallons. Water is released at a 5 gallons per minute. If the faucet is left open for 1 hour, which equation can be used to find r , the number of gallons of water remaining in the tank?

1 hour = 60 minutes

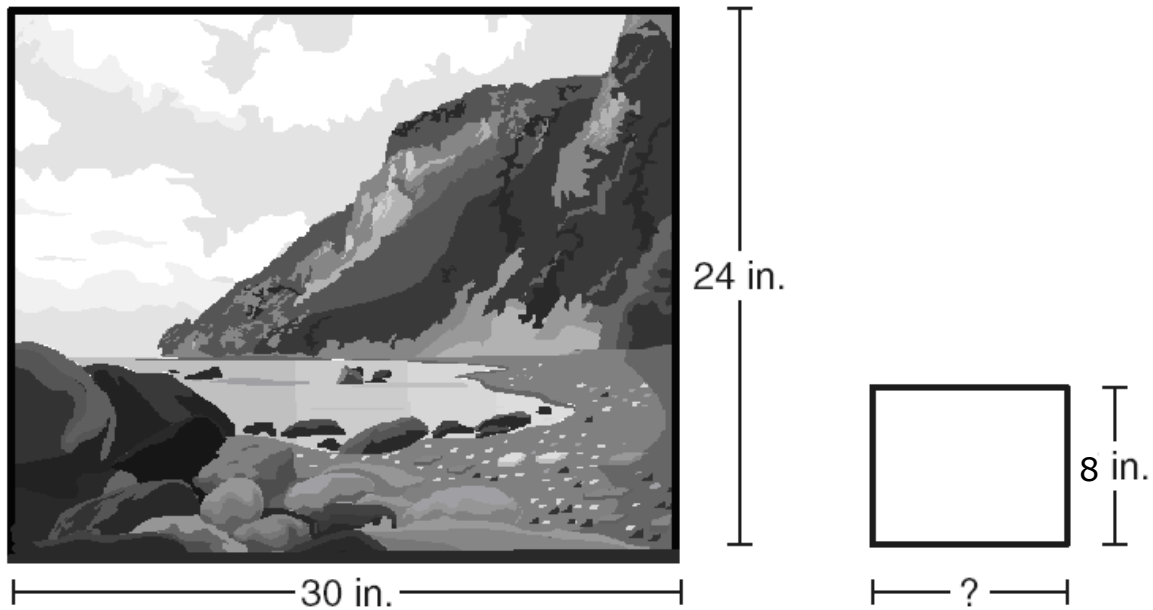
A $r = 2,500 - 60$

B $r = 2,500 \div 5$

C $r = 2,500 - 60(5)$



16. Look at the picture below.



If the reduced picture was similar to the original and the height of the reduced picture was 8 inches, what was its width?

- F** 5 in.
- G** 15 in.
- H** 10 in.



17. The area of a square is 81 square meters. Which of these shows the length of each side of the square?

$$A = 81 \text{ meters}^2$$

Area of a Square

$$A = \text{side}^2$$



___ m

A 9 m

C 3 m

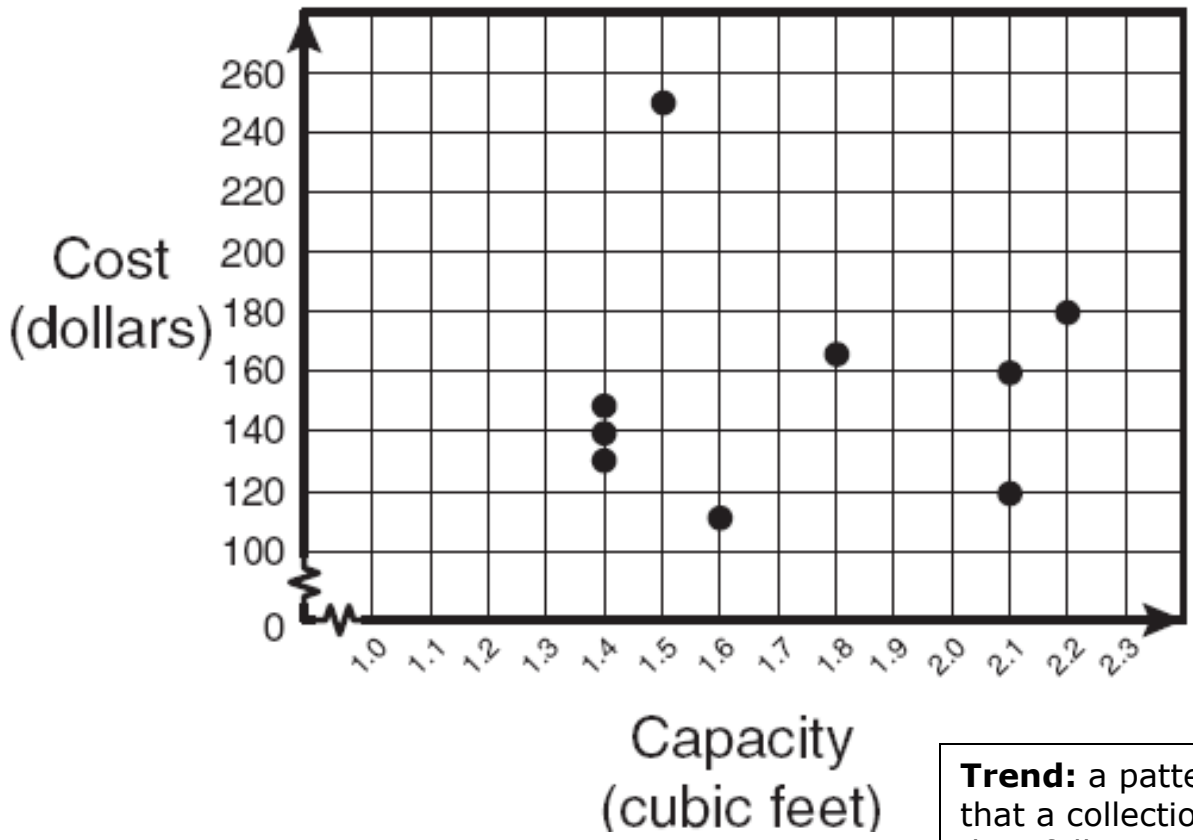
H 12 m

GO ON 

18. Which best describes the trend shown in the scatterplot?

Scatterplot: a graph with points plotted to show the relationship between two variables

Microwave Ovens



Trend: a pattern that a collection of data follows

Which best describes the **trend** shown in the scatterplot?

- F** Positive trend
- G** Negative trend
- H** No trend



19. Sam is planning a trip of 1,450 miles. He plans to drive between 250 and 300 miles each day. At this rate, which is a reasonable number of days it will take Sam to complete his trip?

- A** More than 10 days
- B** Between 4 and 6 days
- C** Less than 2 days

20. A fast train travels at an average speed of 163 miles per hour. The equation below shows the relationship between **d**, the number of miles the train travels, and **t**, the number of hours it travels.

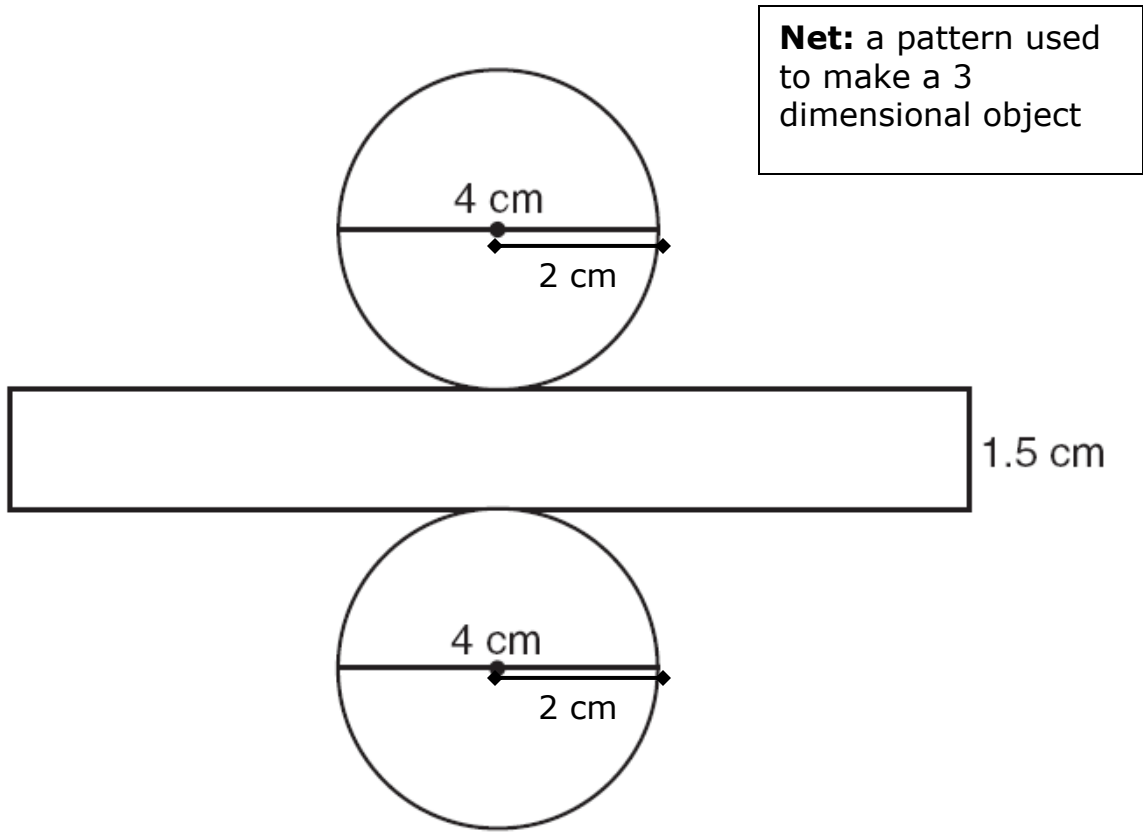
$$d = 163t$$

What is the distance in miles the train will travel in 2 hours?

- F** 326 miles
- G** 110 miles
- H** 900 miles



21. The Candy Factory makes candy in the shape of cylinders. The **net** of a cylindrical piece of candy is shown below.



Net: a pattern used to make a 3 dimensional object

The circumference of the circle is equal to the length of the rectangle. Which is closest to the total surface area of this piece of candy?

- A** 76 cm²
- B** 8 cm²
- C** 44 cm²

Area of a Rectangle
A = length x width

Area of a Circle
A = πr^2

Circumference of a Circle
C = πd



22. Let n represent the **position of a term** in the sequence below.

8, 11, 14, 17, 20, 23, . . .

<p>Position of a term: what place in a sequence a number is in; first, second,...</p>
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Which algebraic expression can be used to find the n th term of the sequence?

F $6n + 2$

G $3n + 5$

H $2n + 6$



23. A rancher sold 100 cows and he recorded the following **data** about them.

Data: collection of information

Cows

Measure of Data	Weight (pounds)
Range	250
Median	475
Mean	505

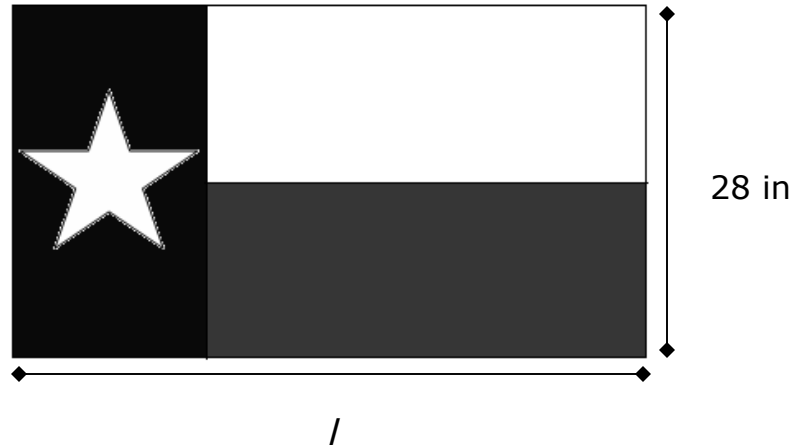
Which measure of data could be used to calculate the total weight of the calves sold?

- A** Mean
- B** Median
- C** Range



24. The Texas state flag is rectangular and has a width-to-length ratio of 2:3.

Which of the following can be used to find l , the length of a Texas state flag with a width of 28 inches?



F $2 \cdot 3 = 28 \cdot l$

G $2 + 28 = l$

H $\frac{2}{3} = \frac{28}{l}$

GO ON 

25. May earns a salary of \$225 per week plus an additional 6% **commission** on her sales.

How much will she earn if her weekly sales are \$2,500?

Commission: extra pay given to a sales person based on how much they have sold

- A** \$125.00
- B** \$700.00
- C** \$375.00



26. The Sundown Parking Garage charges \$5.00 to park a car for the first hour and \$1.00 for each additional hour after the first hour.

What is the total charge for parking a car for 5 hours in this garage?

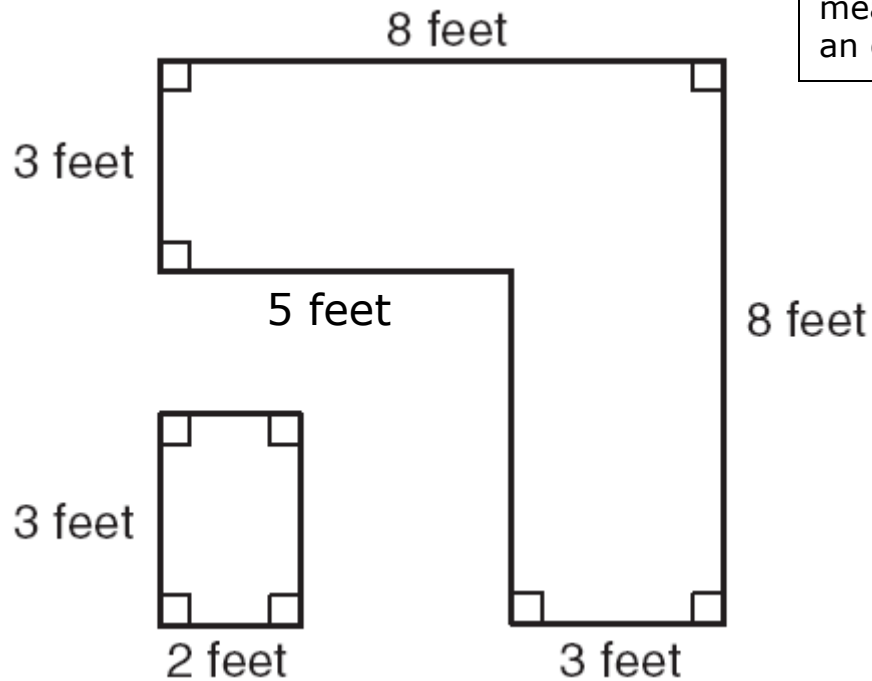
F \$15.00

G \$5.00

H \$9.00



27. Mr. Jones wants to install new countertops on his 2 kitchen counters. The drawing below shows the **dimensions** of the counters.



Dimensions: the measurements of an object

$A = \text{length} \times \text{width}$

What is the amount of material needed to cover the tops of both kitchen counters with no material left over?

- A** 78 ft²
- B** 6 ft²
- C** 45 ft²



28. Look at the list below.

62.5%, $\frac{2}{3}$, 75%, and $\frac{1}{2}$

Which list shows the list of numbers from greatest to least?

F $\frac{1}{2}$, 75%, $\frac{2}{3}$, 62.5%

G 75%, $\frac{2}{3}$, 62.5%, $\frac{1}{2}$

H 62.5%, 75%, $\frac{2}{3}$, $\frac{1}{2}$



29. The table below shows a relationship between x and y .

x	y
0	3
1	8
3	18
4	23
6	33

Which equation best represents this relationship?

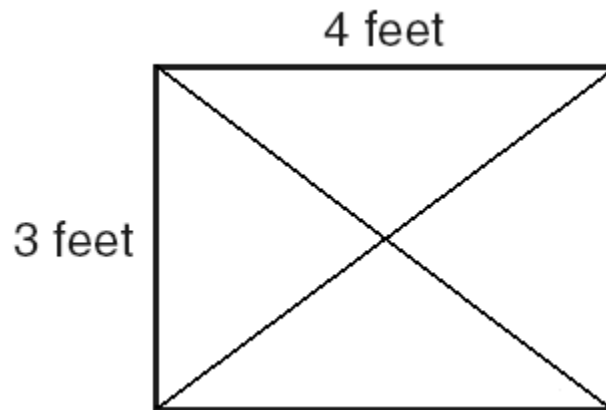
A $y = 5x + 3$

B $y = 3x$

C $y = x + 3$



30. Look at the figure below.



$$a^2 + b^2 = c^2$$

What is the length of the two **diagonal lines**?

F 23 ft

G 6 ft

H 10 ft

Diagonal lines:
lines that are at a
slant; not straight up
or down



31. Mandy bought a CD for 40% off the regular price of \$16.00, not including tax.

How much more money would Mandy have saved, not including tax, if she had bought the CD for 65% off the regular price?

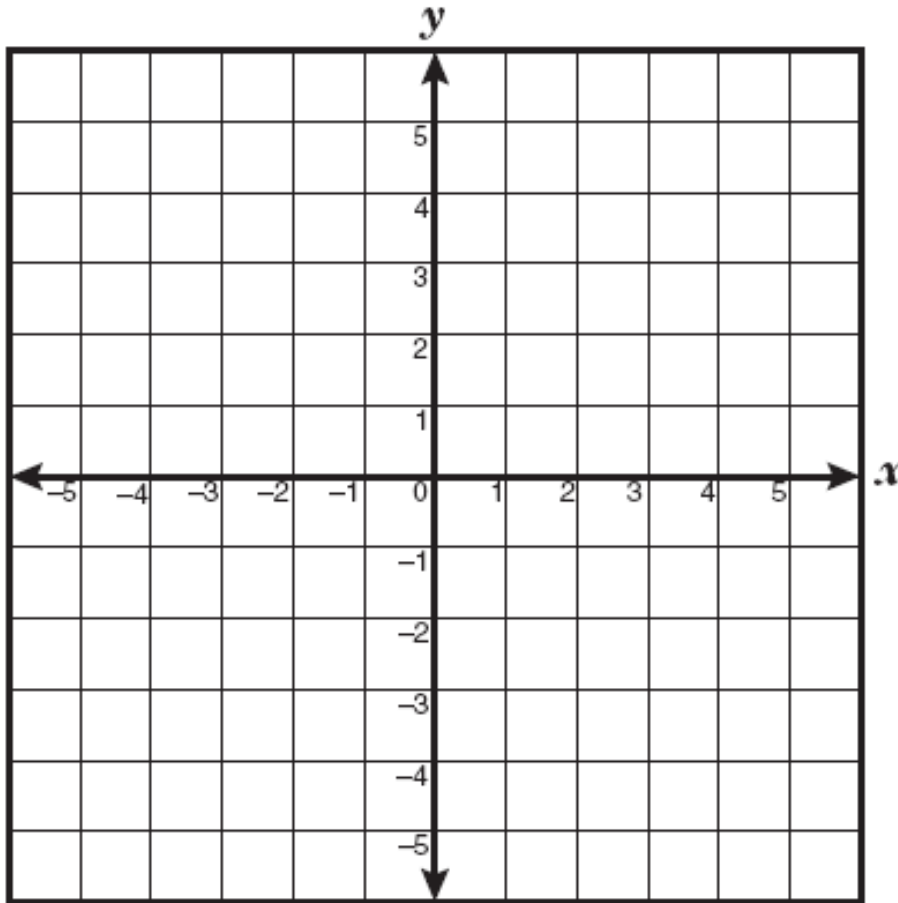
A \$4.00

B \$15.25

C \$1.15



32. Which ordered pair is located in Quadrant IV?



F $(-1, 4)$

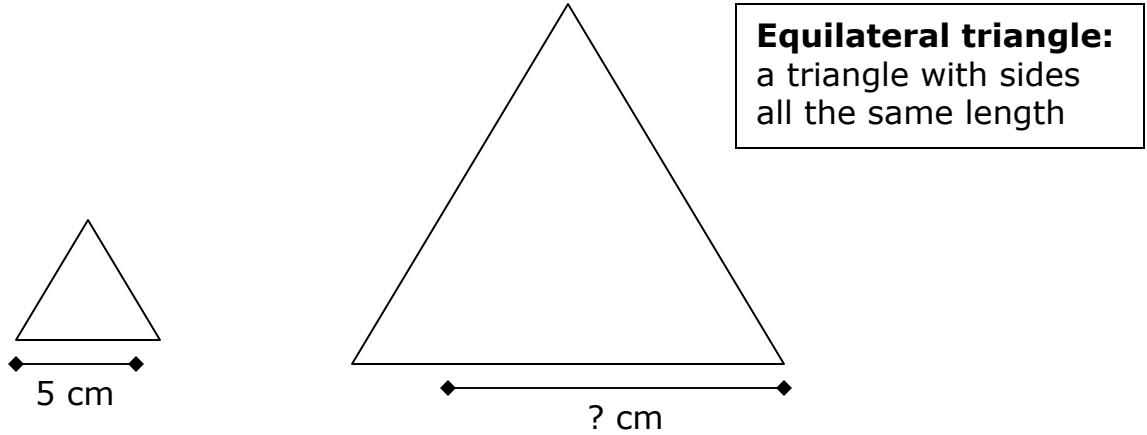
G $(3, -3)$

H $(-2, -11)$

GO ON 

33. Mrs. Martin placed a picture of an **equilateral triangle** on an overhead projector in her math class. The overhead projector **dilated** the triangle’s image on the screen by a **scale factor** of 3.5.

If the length of each side of the actual triangle is 5 centimeters, what is the length of each side of the dilated triangle on the screen?



Dilated: made larger; expanded

Scale factor: the value that represents the size difference between two objects

- A** 3 cm
- B** 17.5 cm
- C** 200 cm



34. A bag contains 6 red, 8 blue, 5 green, 9 yellow, and 2 white marbles that are all the same size and shape.

What is the probability of **randomly** choosing a white marble on the first pick, replacing it, and then randomly choosing a green marble on the second pick?

Randomly: using no guidelines or criteria.

F $\frac{1}{90}$

G $\frac{8}{76}$

H $\frac{1}{5}$



35. The table shows the relationship between the weight of a package and the cost of mailing it.

Mailing a Package

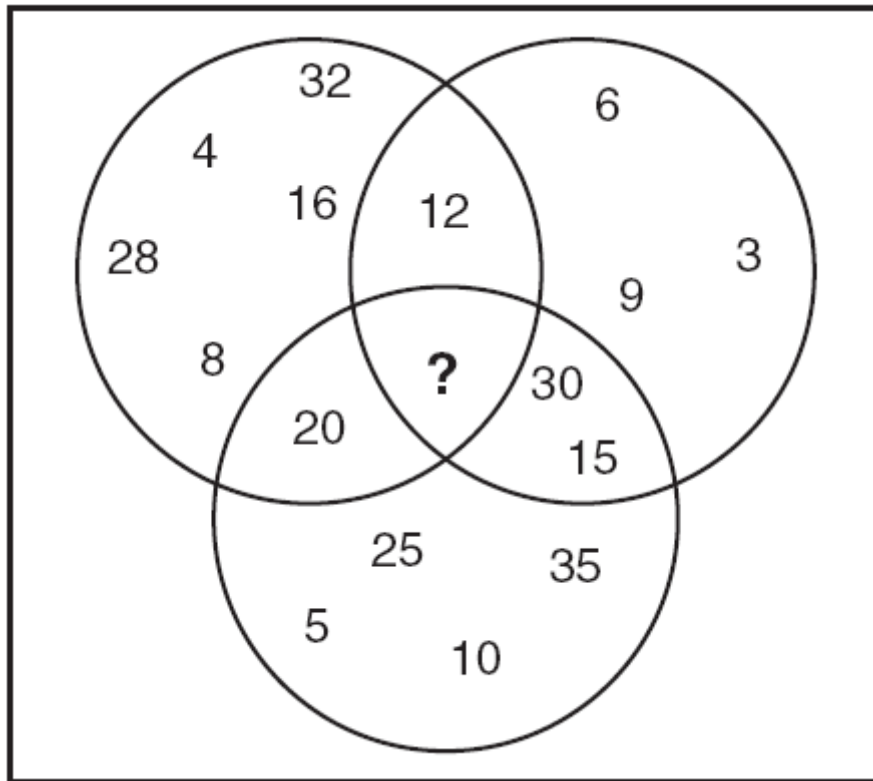
Weight (ounces)	Cost
1 or less	\$0.37
2	\$0.60
3	\$0.83
4	\$1.06
8	\$1.98
13	?

Based on the pattern in the table, what will it cost to mail a 13-ounce package?

- A** \$0.98
- B** \$15.25
- C** \$3.13



36. This Venn diagram is used to classify counting numbers according to a set of rules.



Which one of the following numbers belongs in the region of the diagram marked by the question mark?

F 110

G 7

H 60

GO ON 

37. Which equation can be used to find m , the number of minutes in h hours?

$1 \text{ hour} = 60 \text{ minutes}$

A $m = 60 - h$

B $m = h + 60$

C $m = 60h$

38. Sharon played a quiz game. There were 10 questions, and she answered 5 of them correctly. At this rate, how many questions should Sharon expect to answer correctly if she answers a total of 130 questions?

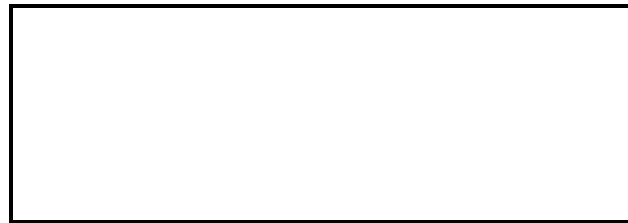
F 10

G 65

H 95



39. A rectangle has a perimeter of 36 inches and an area of 65 square inches.



width

length

$$\text{Perimeter (P)} = 2w + 2l$$

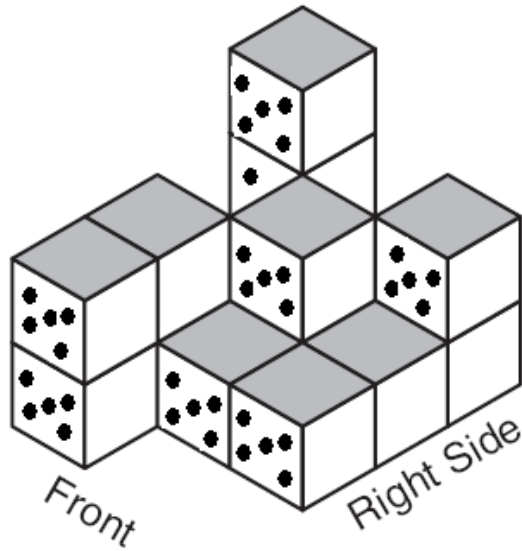
$$\text{Area (A)} = \text{length} \times \text{width}$$

Which of the following could be the dimensions of the rectangle?

- A** 10 inches by 3 inches
- B** 8 inches by 26 inches
- C** 5 inches by 13 inches

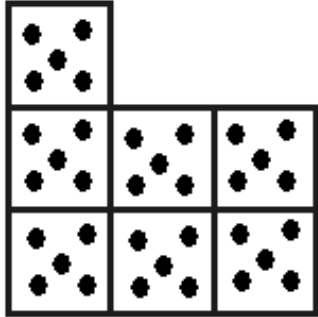


40. Melody made a solid figure by stacking cubes. The solid figure is shown below.



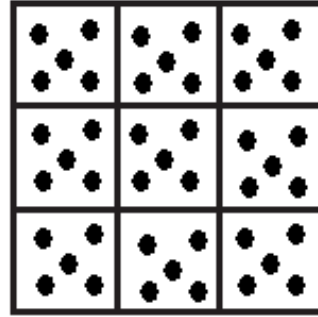
Which drawing best represents a front view of this solid figure?

F



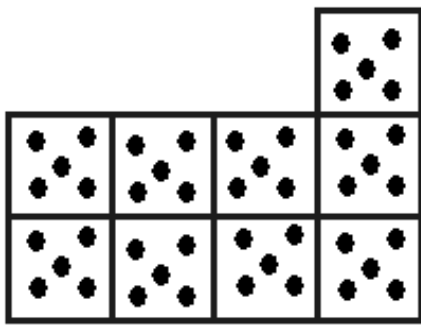
Front

H



Front

G



Front

