

VIRGINIA STANDARDS OF LEARNING

Spring 2010 Released Test

GRADE 8 MATHEMATICS

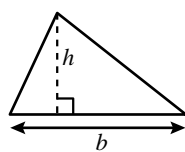
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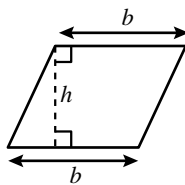
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Grade 8 Mathematics Formula Sheet

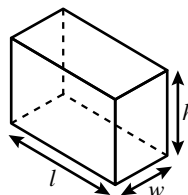
Geometric Formulas



$$A = \frac{1}{2}bh$$

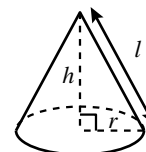


$$A = bh$$



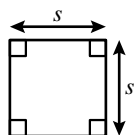
$$V = lwh$$

$$S.A. = 2lw + 2lh + 2wh$$



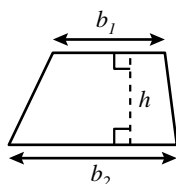
$$V = \frac{1}{3}\pi r^2 h$$

$$S.A. = \pi rl + \pi r^2$$

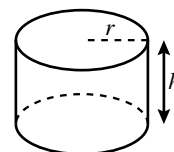


$$p = 4s$$

$$A = s^2$$

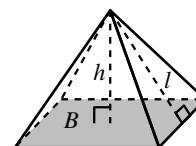


$$A = \frac{1}{2}h(b_1 + b_2)$$



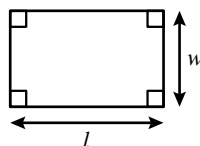
$$V = \pi r^2 h$$

$$S.A. = 2\pi rh + 2\pi r^2$$



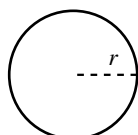
$$V = \frac{1}{3}Bh$$

$$S.A. = \frac{1}{2}lp + B$$



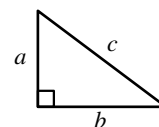
$$p = 2l + 2w$$

$$A = lw$$



$$C = 2\pi r$$

$$A = \pi r^2$$



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

Abbreviations

| | |
|-------------------|-----------------|
| milligram | mg |
| gram | g |
| kilogram | kg |
| milliliter | mL |
| liter | L |
| kiloliter | kL |
| millimeter | mm |
| centimeter | cm |
| meter | m |
| kilometer | km |
| square centimeter | cm ² |
| cubic centimeter | cm ³ |

| | |
|--------------------|------|
| volume | V |
| total surface area | S.A. |
| area of base | B |

| | |
|-------------|--------|
| ounce | oz |
| pound | lb |
| quart | qt |
| gallon | gal. |
| inch | in. |
| foot | ft |
| yard | yd |
| mile | mi. |
| square inch | sq in. |
| square foot | sq ft |
| cubic inch | cu in. |
| cubic foot | cu ft |

| | |
|--------|-----|
| year | yr |
| month | mon |
| hour | hr |
| minute | min |
| second | sec |

Pi

$$\pi \approx 3.14$$

$$\pi \approx \frac{22}{7}$$

Directions

Read each question and choose the best answer.

SAMPLE

Vicki had \$228. She spends \$37 on a gift. How much did she have left?

- A** \$211
- B** \$191
- C** \$181
- D** \$164

1 Which value is equivalent to the expression shown?

$$-5(3 \cdot 2 - 4)$$

- A** -5
- B** -10
- C** -26
- D** -45

2 Which number is *less than* 22,874 ?

- F** 2.18×10^4
- G** 2.55×10^4
- H** 2.43×10^5
- J** 1.78×10^6

3 What is the value of $4 - 3^3$?

- A** -23
- B** -5
- C** 1
- D** 3

4 Which of the following does *not* represent a rational number?

F 0

G $2\frac{1}{2}$

H $\sqrt{3}$

J $-\frac{1}{10}$

5 Which of these is a true statement?

A $2 \times 10^{-2} > 2 \times 10^2$

B $3.1 \times 10^3 = 3,100$

C $2.5 \times 10^{-2} = 250$

D $0.235 < 2.35 \times 10^{-2}$

6 The set of whole numbers is *not* a subset of —

F irrational numbers

G integers

H rational numbers

J real numbers

7 Which list of numbers is ordered from *greatest to least*?

- A** 3.84×10^9 , 6.13×10^6 , 4.72×10^4 , 7.76×10^2
- B** 3.84×10^9 , 4.72×10^4 , 6.13×10^6 , 7.76×10^2
- C** 7.76×10^2 , 6.13×10^6 , 4.72×10^4 , 3.84×10^9
- D** 7.76×10^2 , 4.72×10^4 , 6.13×10^6 , 3.84×10^9

8 Which of the following describes a square root of 41 ?

- F** Between 5 and 6
- G** Between 6 and 7
- H** Between 20 and 21
- J** Between 40 and 42

9 What is the value of $2(5 - a)^2 + 7a$ when $a = 2$?

- A** 16
- B** 20
- C** 32
- D** 50

- 10** Rob had \$363.75 in his bank account on June 12. He made one deposit and two withdrawals as shown.

Rob's Bank Account

| Date | Withdrawal | Deposit | Balance |
|---------|------------|---------|----------|
| June 12 | | | \$363.75 |
| June 13 | \$47.50 | | |
| June 14 | | \$91.25 | |
| June 15 | \$54.75 | | |

What was the balance in Rob's bank account after the withdrawal on June 15 ?

- F** \$170.25
- G** \$352.75
- H** \$374.75
- J** \$557.25

- 11** What is the value of $x^3 + x^2 + x$ when $x = 3$?

- A** 9
- B** 18
- C** 21
- D** 39

12 Which number is a perfect square?

- F** 6
- G** 9
- H** 12
- J** 15

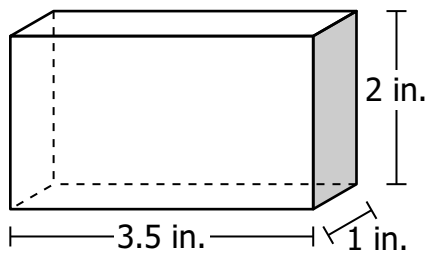
13 Albert had a goal of saving \$80. He saved 115% of his goal. How much money did Albert save?

- A** \$70
- B** \$92
- C** \$115
- D** \$195

14 The square root of which of the following integers is between 7 and 8 ?

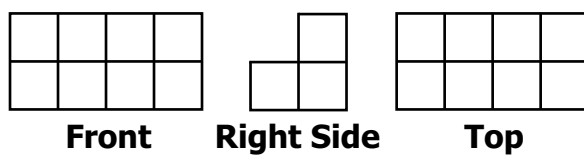
- F** 49
- G** 52
- H** 64
- J** 65

15 What is the surface area of a rectangular prism with the dimensions shown?

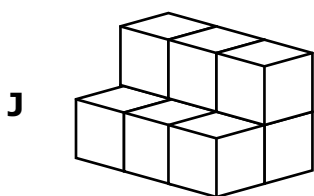
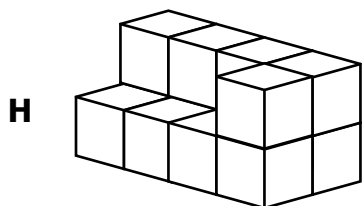
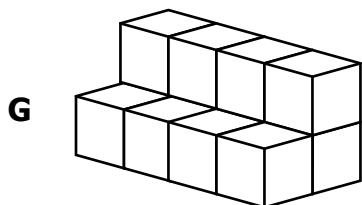
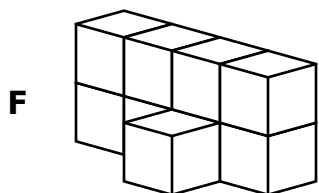


- A** 7 sq in.
- B** 14 sq in.
- C** 18 sq in.
- D** 25 sq in.

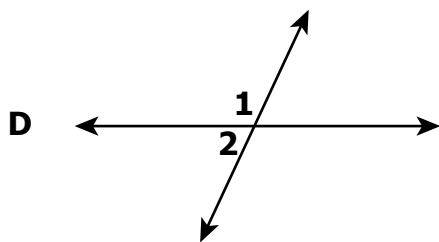
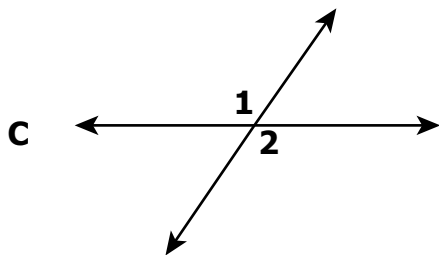
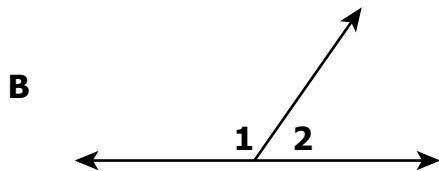
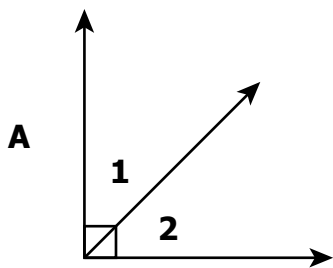
- 16 Three different views of a three-dimensional figure constructed from cubes are shown.



Which of the following figures could these views represent?



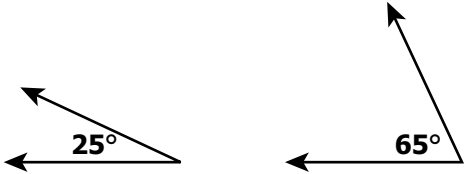

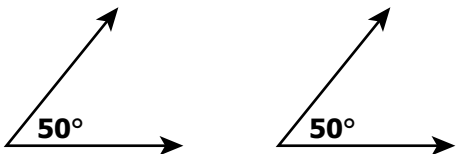
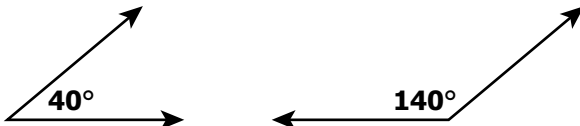
17 In which diagram do $\angle 1$ and $\angle 2$ appear to be vertical angles?



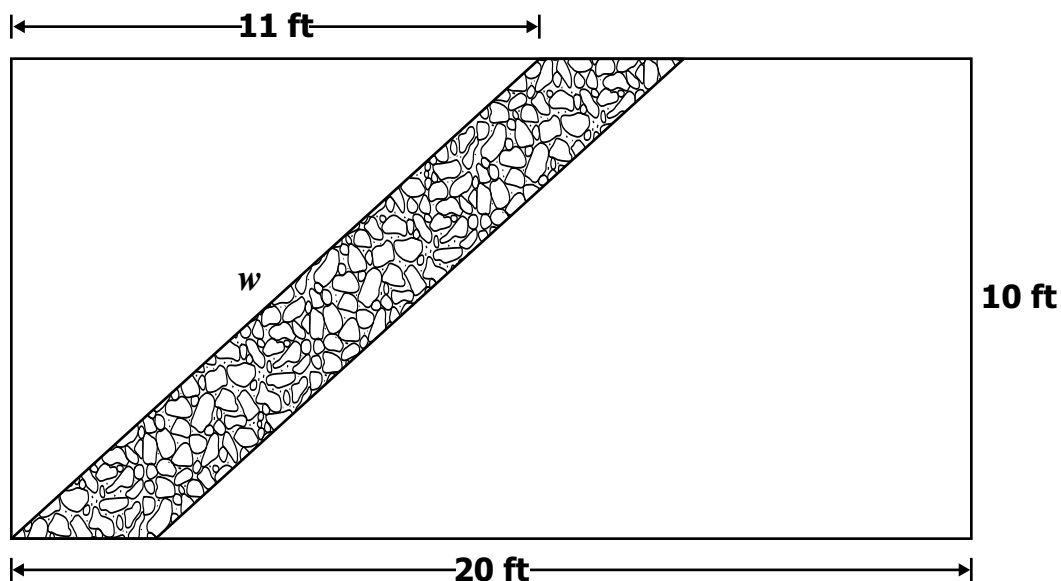
18 Which group of three side lengths could form a right triangle?

- F** 5 ft, 12 ft, 13 ft
- G** 7 ft, 11 ft, 14 ft
- H** 15 ft, 20 ft, 22 ft
- J** 18 ft, 34 ft, 39 ft

19 Which pair of angles is supplementary?

- A**
- 
- B**
- 
- C**
- 
- D**
- 

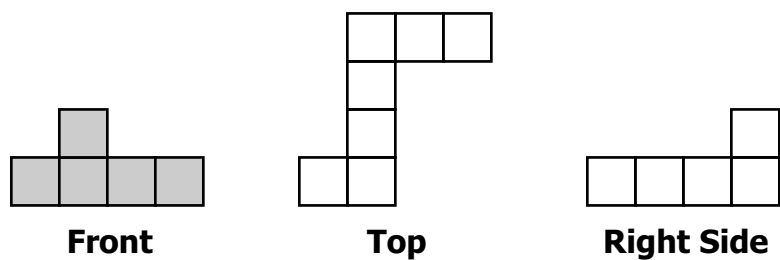
- 20 Mr. Malone plans to construct a walkway through his rectangular garden, as shown in the drawing.



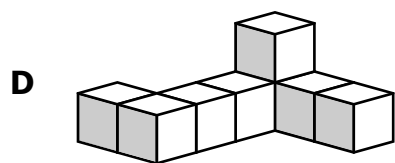
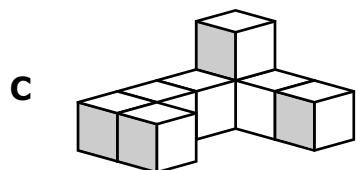
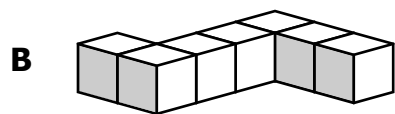
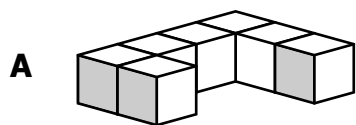
Which is closest to the value of w ?

- F 22 ft
- G 21 ft
- H 15 ft
- J 11 ft

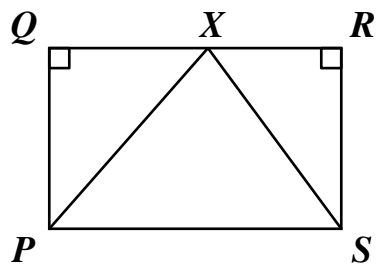
- 21 A three-dimensional figure is constructed from identical cubes. Three views of the figure are shown.



Which of the following could be the three-dimensional figure?



22 Three triangles are drawn in rectangle $PQRS$.



Which of the following segments is a hypotenuse of one of these triangles?

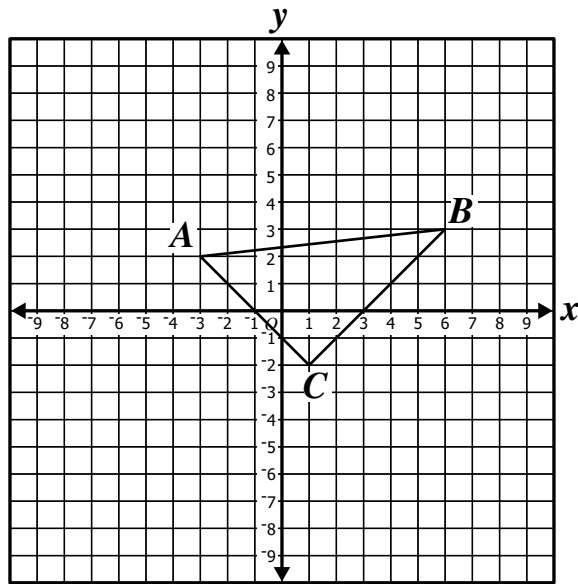
F \overline{RS}

G \overline{RQ}

H \overline{XS}

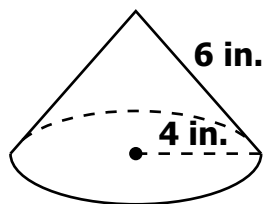
J \overline{XQ}

- 23 What are the new coordinates of point B after $\triangle ABC$ is translated 2 units down and 3 units to the left?



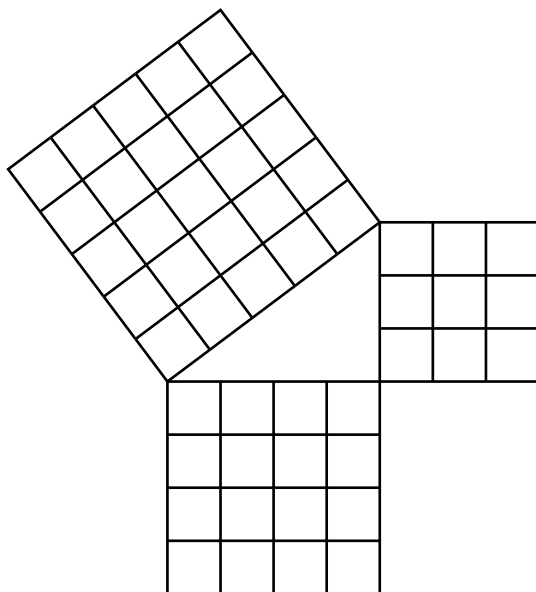
- A (3, 1)
- B (4, 0)
- C (8, 6)
- D (9, 5)

- 24 The radius of the base of a cone is 4 inches. The slant height of the cone is 6 inches. Which is closest to the surface area of the cone?

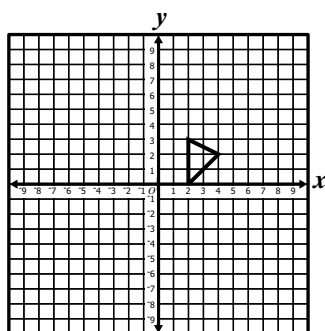


- F** 75 sq in.
G 100 sq in.
H 126 sq in.
J 188 sq in.

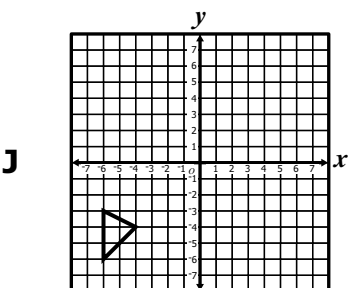
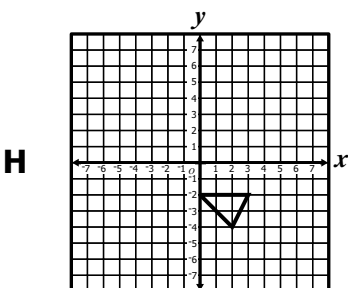
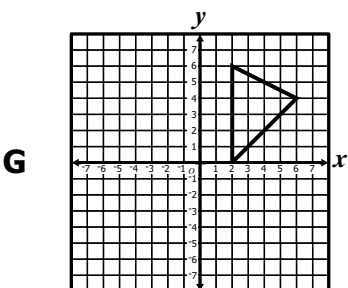
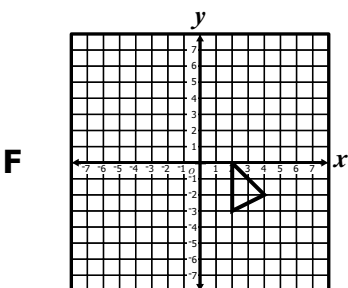
- 25 Which of the following equations is represented by the figure?



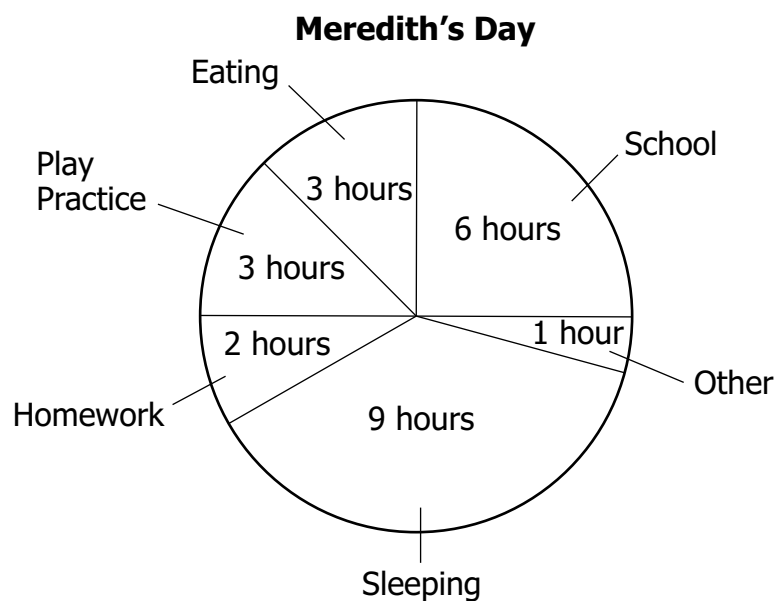
- A** $4^2 + 5^2 = 9^2$
B $3^2 + 5^2 = 8^2$
C $3^2 + 4^2 = 7^2$
D $3^2 + 4^2 = 5^2$



Which of the following graphs shows a dilation of the triangle from a fixed point?



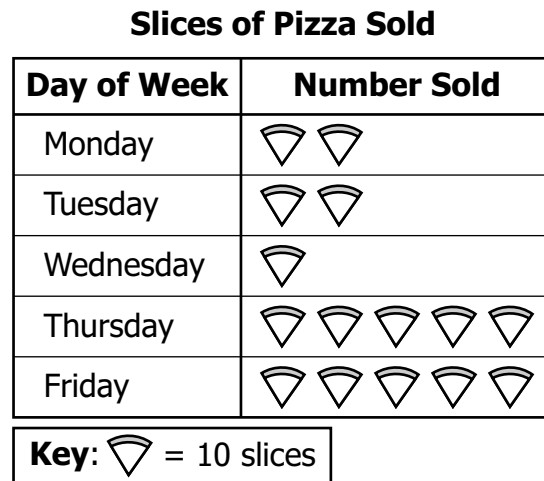
- 27 This circle graph displays the number of hours Meredith spent on various activities in a day.



Based on the data in the circle graph, what percent of Meredith's day was spent on activities other than sleeping and eating?

- A 12%
- B 25%
- C 38%
- D 50%

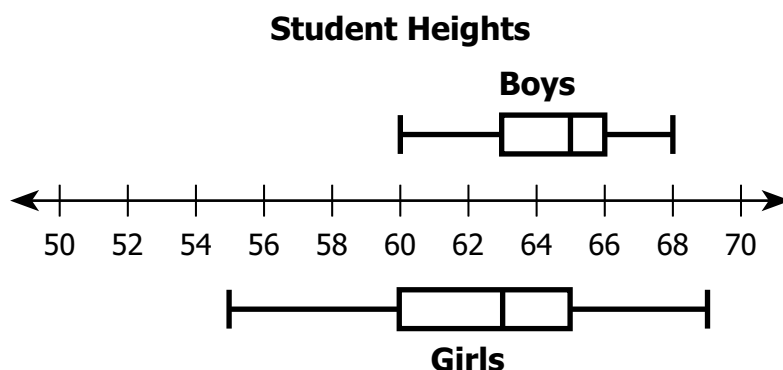
- 28 This graph shows the number of slices of pizza sold each day during one week in the school cafeteria.



Each slice of pizza costs \$0.50. What is the total amount of money the school cafeteria collected on the sales of pizza for this week?

- F \$7.50
G \$15.50
H \$75.00
J \$150.00
- 29 A fair cube used in a game has 1 yellow side and 5 green sides. Emily will win the game if the cube lands on a green side on her next roll. Which statement *best* describes Emily's chance of winning the game?
- A Certainly will win
B Certainly will lose
C Most likely will win
D Most likely will lose

- 30 These box-and-whisker plots summarize the heights of the boys and the heights of the girls in an eighth-grade class.



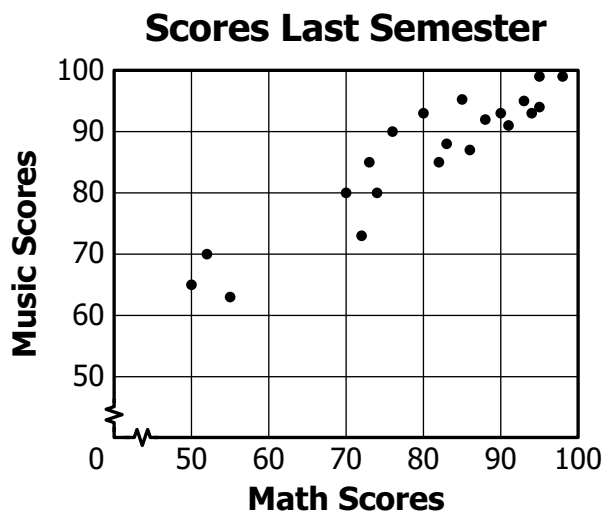
Based on the data in these box-and-whisker plots, which statement is true?

- F** The tallest student in the class is a girl.
 - G** The shortest student in the class is a boy.
 - H** The range of the boys' heights is greater than the range of the girls' heights.
 - J** The median height of the girls is greater than the median height of the boys.
- 31 This matrix shows the grades on three weekly quizzes for Eric, Sam, and Curt. What is the element at row 2, column 3 ?

| | Eric | Sam | Curt |
|-----|------|-----|------|
| 1st | 87 | 92 | 82 |
| 2nd | 82 | 86 | 80 |
| 3rd | 85 | 88 | 89 |

- A** 80
- B** 86
- C** 87
- D** 88

- 32 The following scatterplot shows the scores several students received in math and music classes last semester.



Which statement best describes the relationship in the scatterplot?

- F** As the math score decreases, the music score increases.
- G** As the math score increases, the music score decreases.
- H** As the math score decreases, the music score does not change.
- J** As the math score increases, the music score increases.

- 33** This table shows the number of marbles in a bag by color. If one marble is randomly selected from the bag, what is the probability that it will be a blue or a red marble?

Marbles in a Bag

| Color | Number |
|--------------|---------------|
| Blue | 7 |
| Green | 10 |
| Yellow | 14 |
| Red | 19 |

- A** 24%
- B** 26%
- C** 38%
- D** 52%

34 Three girls sent each other text messages as shown.

- Sonia sent Hannah 3 text messages and Takara 2 text messages.
- Hannah sent Sonia 1 text message and Takara 3 text messages.
- Takara sent Sonia 2 text messages and Hannah 1 text message.

Which matrix best summarizes this information?

| | | To | | | |
|----------|--------------------|-------|--------|--------|---|
| | | Sonia | Hannah | Takara | |
| F | Sonia | 0 | 1 | 2 |] |
| | From Hannah | 3 | 0 | 1 | |
| | Takara | 2 | 3 | 0 | |

| | | To | | | |
|----------|--------------------|-------|--------|--------|---|
| | | Sonia | Hannah | Takara | |
| G | Sonia | 1 | 1 | 2 |] |
| | From Hannah | 1 | 3 | 3 | |
| | Takara | 2 | 1 | 1 | |

| | | To | | | |
|----------|--------------------|-------|--------|--------|---|
| | | Sonia | Hannah | Takara | |
| H | Sonia | 0 | 3 | 2 |] |
| | From Hannah | 1 | 0 | 3 | |
| | Takara | 2 | 1 | 0 | |

| | | To | | | |
|----------|--------------------|-------|--------|--------|---|
| | | Sonia | Hannah | Takara | |
| J | Sonia | 2 | 1 | 0 |] |
| | From Hannah | 0 | 3 | 2 | |
| | Takara | 1 | 0 | 3 | |

- 35 Margaret has \$200 in her savings account. She will deposit \$50 into this account each week and will make no withdrawals. Which table represents this situation, excluding interest?

Savings

A

| Week | Amount in Account |
|------|-------------------|
| 0 | \$200 |
| 1 | \$250 |
| 2 | \$300 |
| 3 | \$350 |

Savings

B

| Week | Amount in Account |
|------|-------------------|
| 0 | \$50 |
| 1 | \$250 |
| 2 | \$450 |
| 3 | \$650 |

Savings

C

| Week | Amount in Account |
|------|-------------------|
| 0 | \$200 |
| 1 | \$150 |
| 2 | \$100 |
| 3 | \$50 |

Savings

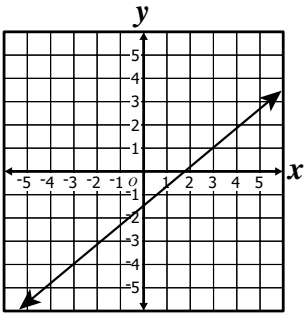
D

| Week | Amount in Account |
|------|-------------------|
| 0 | \$50 |
| 1 | \$100 |
| 2 | \$150 |
| 3 | \$200 |

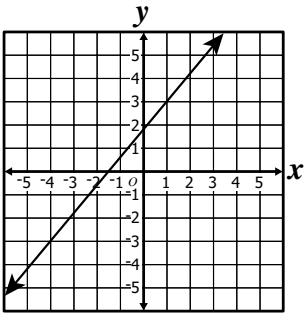
36 Which graph contains all the ordered pairs in this table?

| x | y |
|-----|-----|
| -3 | -4 |
| 3 | 1 |
| 5 | 2 |

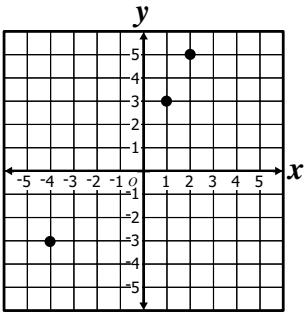
F



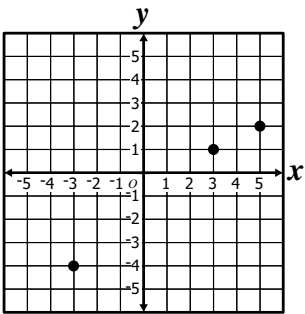
G



H



J



37 Which of the following is equivalent to the inequality $5x + 7 < 17$?

- A** $5x < 10$
- B** $5x > 10$
- C** $5x < 24$
- D** $5x > 24$

38 Which table contains only points that lie on the line of the equation $y = 6x - 6$?

F

| x | y |
|-----|-----|
| 0 | -6 |
| 5 | 5 |

G

| x | y |
|-----|-----|
| 0 | 6 |
| 3 | 12 |

H

| x | y |
|-----|-----|
| 2 | 6 |
| -2 | -18 |

J

| x | y |
|-----|-----|
| 2 | 6 |
| -1 | 0 |

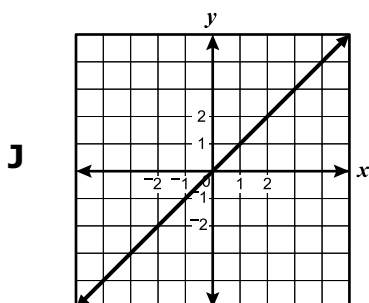
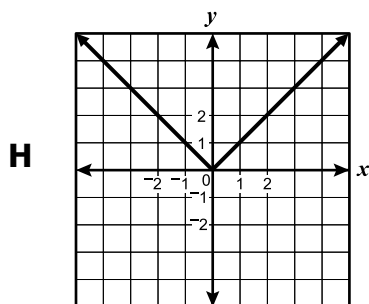
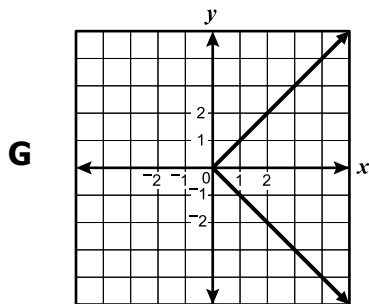
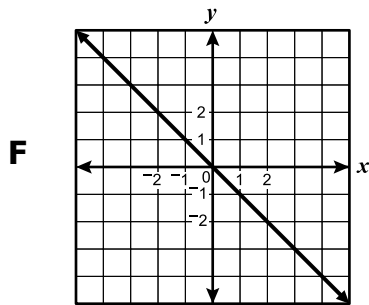
39 What value of n makes this equation true?

$$4n + 9 = 6$$

- A** -7.50
- B** -0.75
- C** 3.75
- D** 10.50

| x | y |
|-----|-----|
| 4 | 4 |
| 2 | 2 |
| 0 | 0 |
| -2 | -2 |
| -4 | -4 |

If the line containing the points in the table is plotted on a coordinate system, what does the graph look like?



41 At the Good Earth Orchard, there are $\frac{1}{3}$ as many lemon trees as there are orange trees. There are 132 orange trees at Good Earth Orchard. How many lemon trees are there?

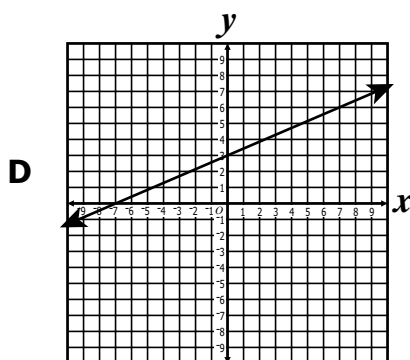
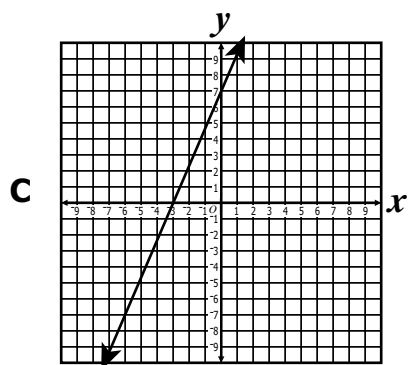
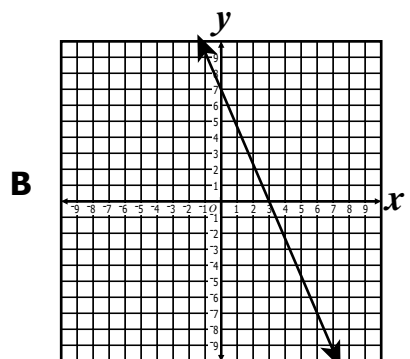
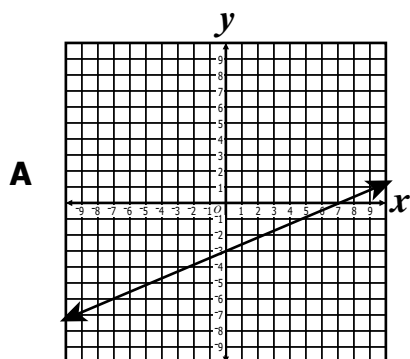
- A** 43
- B** 44
- C** 396
- D** 528

42 The formula $d = 52t + 65t$ can be used to find the distance, d , between two cars after traveling t hours in opposite directions. After how many hours will the distance between the two cars be 234 miles?

- F** 0.5
- G** 2.0
- H** 3.6
- J** 4.5

43 Which graph contains the ordered pairs listed in the table?

| x | y |
|-----|-----|
| 0 | 7 |
| -3 | 0 |



44 Which number is *not* an element of the domain of the relation shown?

$$\{(-2, 4), (0, 4), (1, 2), (3, 2)\}$$

F -2

G 0

H 1

J 4

45 Which of the following tables of values is true for the equation $y = 3(x - 3)$?

A

| x | y |
|-----|-----|
| -4 | -21 |
| 4 | 3 |

B

| x | y |
|-----|-----|
| -4 | -3 |
| 4 | 21 |

C

| x | y |
|-----|-----|
| -4 | -15 |
| 4 | 9 |

D

| x | y |
|-----|-----|
| -4 | -9 |
| 4 | 15 |

46 It takes Kim 8 hours to travel a distance of 360 miles. At this rate, how many miles does Kim travel in 12 hours?

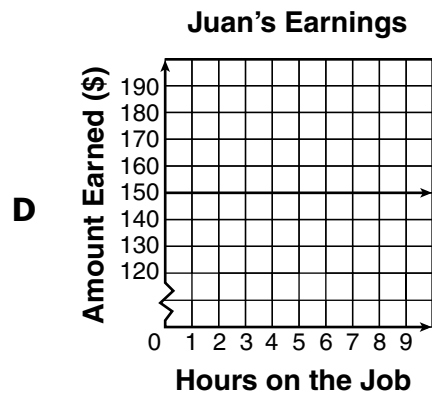
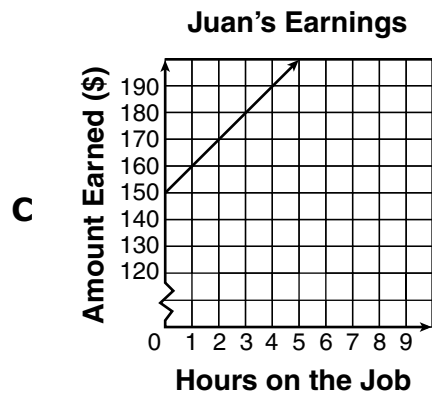
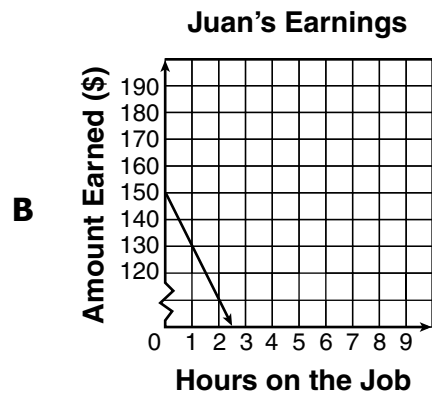
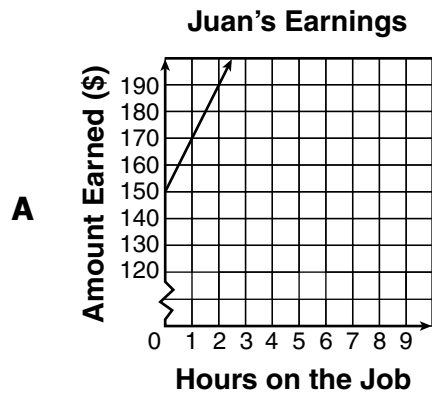
F 720

G 600

H 540

J 390

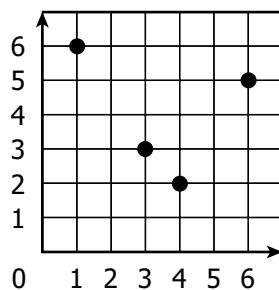
- 47 Juan earns a flat fee of \$150 plus \$20 for every hour he works decorating a house. Which graph correctly displays Juan's earnings?



48 What is the solution to $\frac{n}{2} - 4 > 10$?

- F** $n > 7$
- G** $n > 12$
- H** $n > 24$
- J** $n > 28$

49 A relation is graphed as shown.



What is the domain of this relation?

- A** $\{1, 3, 4, 6\}$
- B** $\{2, 3, 5, 6\}$
- C** $\{1, 2, 3, 4, 5, 6\}$
- D** $\{0, 1, 2, 3, 4, 5, 6\}$

50 Which of these equations represents the table of values?

| x | y |
|-----|-----|
| -2 | 2 |
| 1 | 8 |
| 3 | 12 |
| 6 | 18 |

F $y = -x$

G $y = x + 7$

H $y = 3x + 3$

J $y = 2x + 6$

