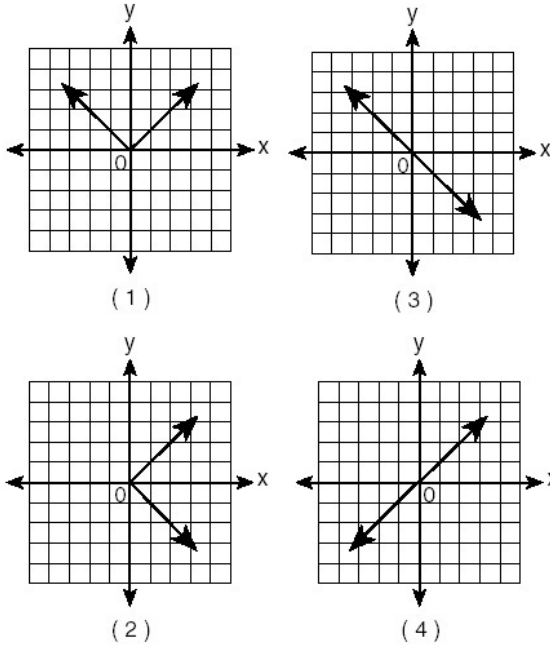


Name:

Date:

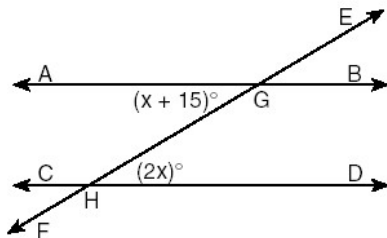
1

Which graph is symmetric with respect to the  $y$ -axis?



2

In the accompanying diagram, parallel lines  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are intersected by transversal  $\overleftrightarrow{EF}$  at points  $G$  and  $H$ , respectively,  $m\angle AGH = x + 15$ , and  $m\angle GHD = 2x$ .



Which equation can be used to find the value of  $x$ ?

- (1)  $2x = x + 15$                       (3)  $2x + x + 15 = 90$   
 (2)  $2x + x + 15 = 180$               (4)  $2x(x + 15) = 0$

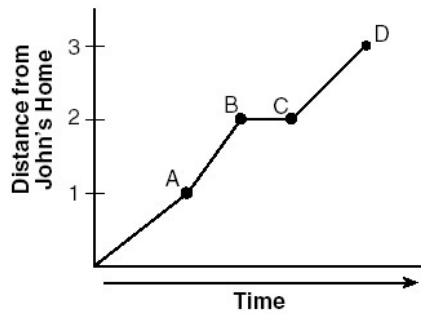
3

The number  $8.375 \times 10^{-3}$  is equivalent to

- (1) 0.0008375                      (3) 0.08375  
(2) 0.008375                        (4) 8,375

4

John left his home and walked 3 blocks to his school, as shown in the accompanying graph.



What is one possible interpretation of the section of the graph from point *B* to point *C*?

- (1) John arrived at school and stayed throughout the day.  
(2) John waited before crossing a busy street.  
(3) John returned home to get his mathematics homework.  
(4) John reached the top of a hill and began walking on level ground.

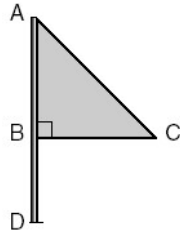
5

Which statement about quadrilaterals is true?

- (1) All quadrilaterals have four right angles.  
(2) All quadrilaterals have equal sides.  
(3) All quadrilaterals have four sides.  
(4) All quadrilaterals are parallelograms.

6

Triangle  $ABC$  represents a metal flag on pole  $AD$ , as shown in the accompanying diagram. On a windy day the triangle spins around the pole so fast that it looks like a three-dimensional shape.

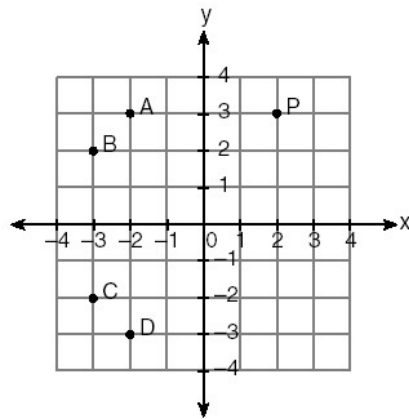


Which shape would the spinning flag create?

- (1) sphere                      (3) right circular cylinder  
 (2) pyramid                    (4) cone

7

In the accompanying graph, if point  $P$  has coordinates  $(a,b)$ , which point has coordinates  $(-b,a)$ ?



- (1) A                              (3) C  
 (2) B                              (4) D

8

If  $2ax - 5x = 2$ , then  $x$  is equivalent to

- (1)  $\frac{2 + 5a}{2a}$                       (3)  $\frac{2}{2a - 5}$   
 (2)  $\frac{1}{a - 5}$                         (4)  $7 - 2a$

9

Which expression represents the number of yards in  $x$  feet?

- (1)  $\frac{x}{12}$                       (3)  $3x$   
(2)  $\frac{x}{3}$                         (4)  $12x$

10

What is the solution set of the equation  $3x^2 - 34x - 24 = 0$ ?

- (1)  $\{-2, 6\}$                       (3)  $\{-\frac{2}{3}, 12\}$   
(2)  $\{-12, \frac{2}{3}\}$                     (4)  $\{-6, 2\}$

11

The inequality  $\frac{1}{2}x + 3 < 2x - 6$  is equivalent to

- (1)  $x < -\frac{5}{6}$                       (3)  $x < 6$   
(2)  $x > -\frac{5}{6}$                       (4)  $x > 6$

12

Delroy's sailboat has two sails that are similar triangles. The larger sail has sides of 10 feet, 24 feet, and 26 feet. If the shortest side of the smaller sail measures 6 feet, what is the perimeter of the *smaller* sail?

- (1) 15 ft                          (3) 60 ft  
(2) 36 ft                        (4) 100 ft

13

The ratio of two supplementary angles is 2:7. What is the measure of the *smaller* angle?

- (1)  $10^\circ$                           (3)  $20^\circ$   
(2)  $14^\circ$                         (4)  $40^\circ$

14

Melissa is walking around the outside of a building that is in the shape of a regular polygon. She determines that the measure of one exterior angle of the building is  $60^\circ$ . How many sides does the building have?

- (1) 6                                (3) 3  
(2) 9                                (4) 12

15

At the beginning of her mathematics class, Mrs. Reno gives a warm-up problem. She says, "I am thinking of a number such that 6 less than the product of 7 and this number is 85." Which number is she thinking of?

- (1)  $11\frac{2}{7}$                       (3) 84  
(2) 13                              (4) 637

16

The number of people on the school board is represented by  $x$ . Two sub-committees with an equal number of members are formed, one with  $\frac{2}{3}x - 5$  members and the other with  $\frac{x}{4}$  members. How many people are on the school board?

- (1) 20                              (3) 8  
(2) 12                              (4) 4

17

The line  $3x - 2y = 12$  has

- (1) a slope of  $\frac{3}{2}$  and a  $y$ -intercept of  $-6$   
(2) a slope of  $-\frac{3}{2}$  and a  $y$ -intercept of  $6$   
(3) a slope of  $3$  and a  $y$ -intercept of  $-2$   
(4) a slope of  $-3$  and a  $y$ -intercept of  $-6$

18

If  $(x - 4)$  is a factor of  $x^2 - x - w = 0$ , then the value of  $w$  is

- (1) 12                              (3) 3  
(2)  $-12$                               (4)  $-3$

19

What is the image of  $(x, y)$  after a translation of 3 units right and 7 units down?

- (1)  $(x + 3, y - 7)$                       (3)  $(x - 3, y - 7)$   
(2)  $(x + 3, y + 7)$                       (4)  $(x - 3, y + 7)$

20

Tara buys two items that cost  $d$  dollars each. She gives the cashier \$20. Which expression represents the change she should receive?

- (1)  $20 - 2d$                               (3)  $20 + 2d$   
(2)  $20 - d$                               (4)  $2d - 20$

21

If  $3(x - 2) = 2x + 6$ , the value of  $x$  is

- (1) 0
- (2) 5
- (3) 12
- (4) 20

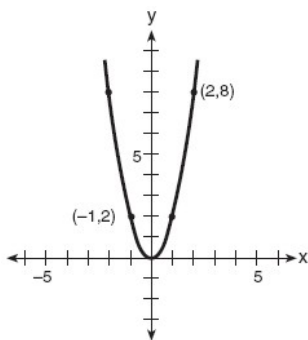
22

Parking charges at Superior Parking Garage are \$5.00 for the first hour and \$1.50 for each additional 30 minutes. If Margo has \$12.50, what is the maximum amount of time she will be able to park her car at the garage?

- (1)  $2\frac{1}{2}$  hours
- (2)  $3\frac{1}{2}$  hours
- (3) 6 hours
- (4)  $6\frac{1}{2}$  hours

23

Which quadratic function is shown in the accompanying graph?



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

24

The graphs of the equations  $y = 2x$  and  $y = -2x + a$  intersect in Quadrant I for which values of  $a$ ?

- (1)  $0 < a < 1$
- (2)  $a < 1$
- (3)  $a \geq 1$
- (4)  $a > 1$

25

For which quadratic equation is the axis of symmetry  $x = 3$ ?

(1)  $y = -x^2 + 3x + 5$

(2)  $y = -x^2 + 6x + 2$

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

(4)  $y = x^2 + x + 3$

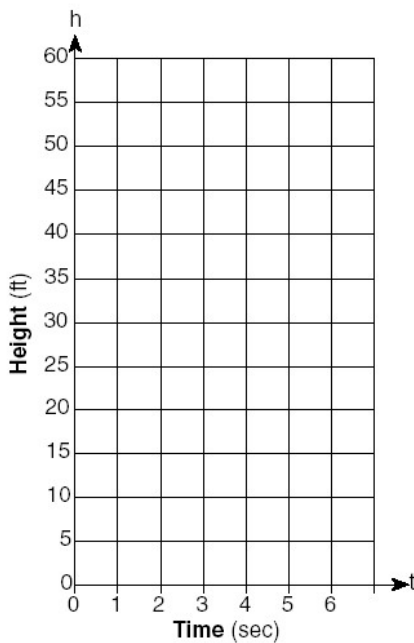
26

Using only 32-cent and 20-cent stamps, Charlie put \$3.36 postage on a package he sent to his sister. He used twice as many 32-cent stamps as 20-cent stamps. Determine how many of *each* type of stamp he used.

27

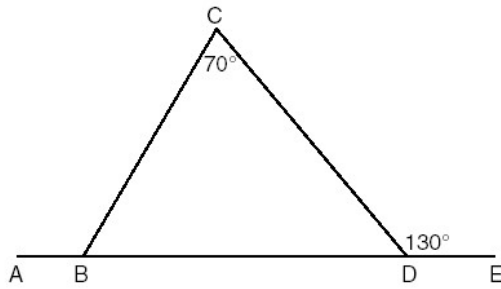
Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation  $h = -8t^2 + 40t$ , where  $h$  is the height, in feet, and  $t$  is the time, in seconds.

- a On the accompanying set of axes, graph the equation from  $t = 0$  to  $t = 5$  seconds, including all integral values of  $t$  from 0 to 5.
- b What is the value of  $t$  at which  $h$  has its greatest value?



28

In the accompanying diagram of  $\triangle BCD$ ,  $m\angle C = 70$ ,  $m\angle CDE = 130$ , and side  $\overline{BD}$  is extended to A and to E. Find  $m\angle CBA$ .

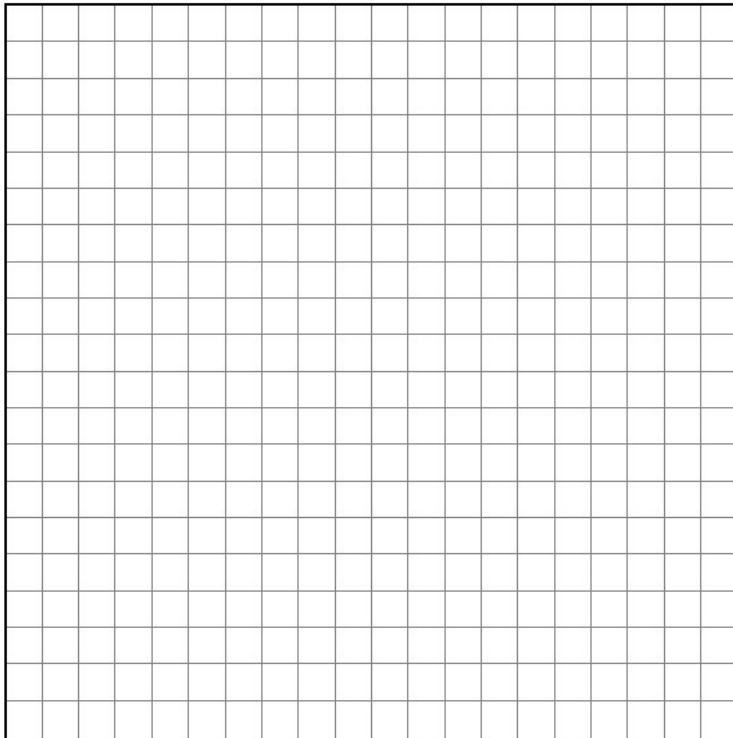


29

Solve the following system of equations algebraically or graphically:

$$\begin{aligned}x^2 + y^2 &= 25 \\ 3y - 4x &= 0\end{aligned}$$

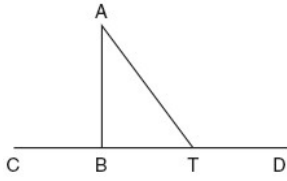
[The use of the accompanying grid is optional.]





30

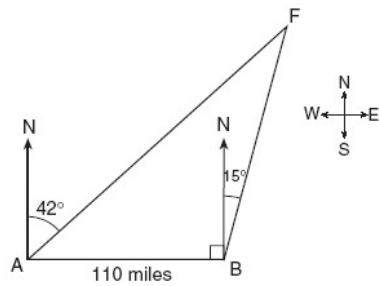
Given:  $\triangle ABT$ ,  $\overline{CBTD}$ , and  $\overline{AB} \perp \overline{CD}$ .



Write an indirect proof to show that  $\overline{AT}$  is not perpendicular to  $\overline{CD}$ .

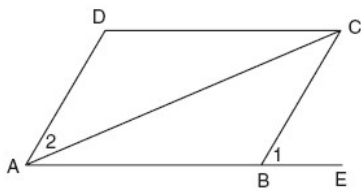
31

As shown in the accompanying diagram, two tracking stations, A and B, are on an east-west line 110 miles apart. A forest fire is located at F, on a bearing  $42^\circ$  northeast of station A and  $15^\circ$  northeast of station B. How far, to the nearest mile, is the fire from station A?



32

Given: parallelogram ABCD, diagonal AC, and ABE



Prove:  $m\angle 1 > m\angle 2$