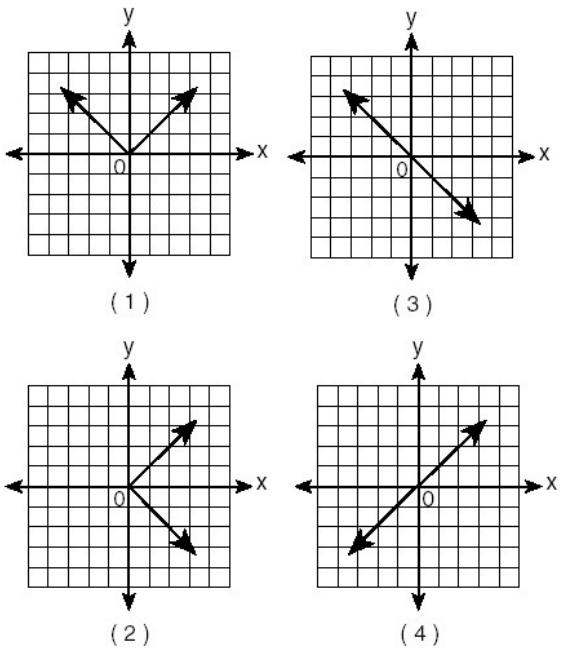
pennsylvania
DEPARTMENT OF EDUCATION
SAS Standards Aligned System

Name: Date:

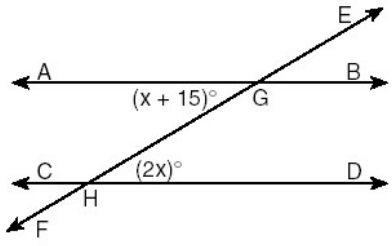
1

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

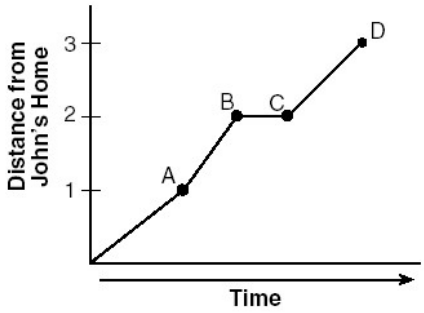
3

The number 8.375×10^{-3} is equivalent to

(1) 0.0008375
(2) 0.008375
(3) 0.08375
(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.

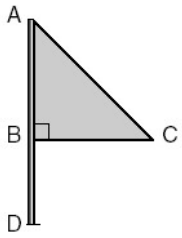
5

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.

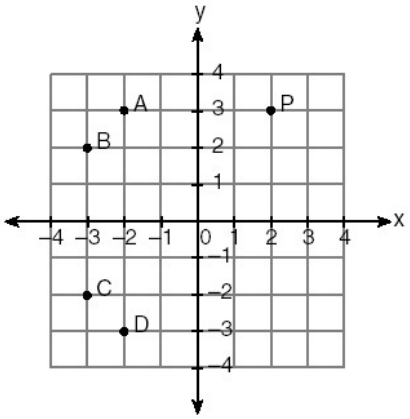


Which shape would the spinning flag create?

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

7

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



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

8

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

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

9

Which expression represents the number of yards in x feet?

(1) $\frac{x}{12}$

(2) $\frac{x}{3}$

(3) $3x$

(4) $12x$

10

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

(1) $\{-2,6\}$

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

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

(4) $\{-6,2\}$

11

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

(1) $x < -\frac{5}{6}$

(2) $x > -\frac{5}{6}$

(3) $x < 6$

(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

(2) 36 ft

(3) 60 ft

(4) 100 ft

13

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

(1) 10°

(2) 14°

(3) 20°

(4) 40°

14

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.

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

16

The number of people on the school board is represented by x. Two subcommittees 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
(2) 12
(3) 8
(4) 4

17

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°. How many sides does the building have?

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

18

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

19

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

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

20

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

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

21

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

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

22

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

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

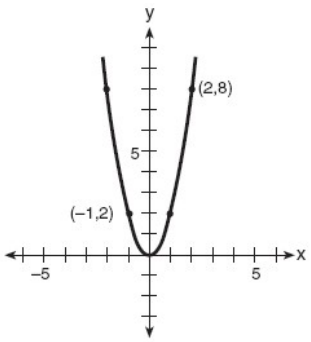
23

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

24

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) $y = \frac{1}{2}x^2$

25

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 ≥ 1
(4) a > 1

26

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

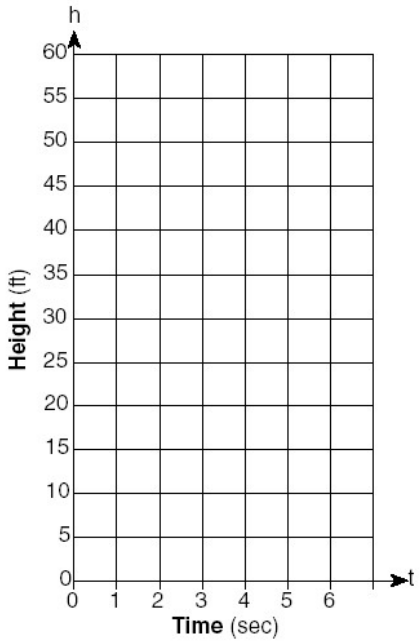
(1) $y = -x^2 + 3x + 5$
(2) $y = -x^2 + 6x + 2$
(3) $y = x^2 + 6x + 3$
(4) $y = x^2 + x + 3$

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.

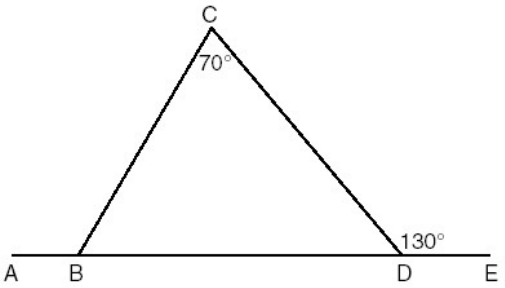
a On the accompanying set of axes, graph the equation from $t = 0$ to $t = 5$ seconds, including all integral values of t from 0 to 5.

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 $m\angle CBA$.

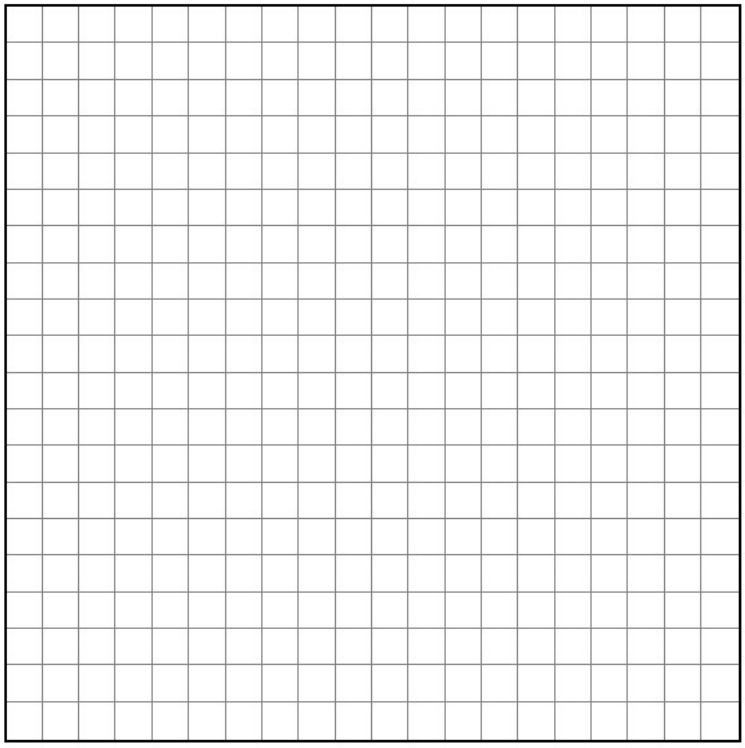


29

Solve the following system of equations algebraically or graphically:

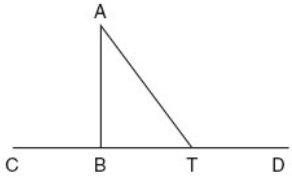
$$x^2 + y^2 = 25$$
$$3y - 4x = 0$$

[The use of the accompanying grid is optional.]



30

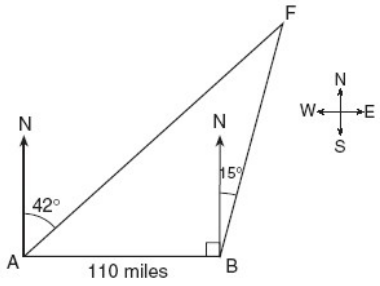
Given: ΔABT, $\overline{CBTD}$, and $\overline{AB} \perp \overline{CD}$



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

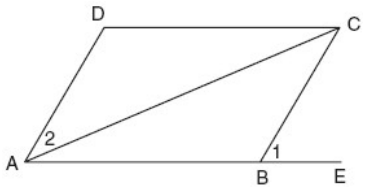
31

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° northeast of station A and 15° northeast of station B. How far, to the *nearest mile*, is the fire from station A?



32

Given: parallelogram ABCD, diagonal $\overline{AC}$, and ABE



Prove: m∠1 > m∠2