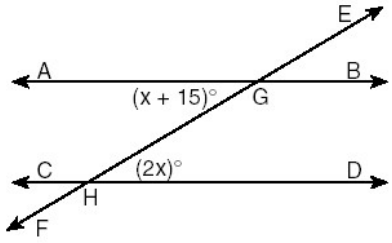
pennsylvania
DEPARTMENT OF EDUCATION

SAS Standards Aligned System

Name: Date:

1

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) $2x(x + 15) = 0$

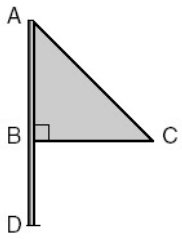
2

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.

3

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.

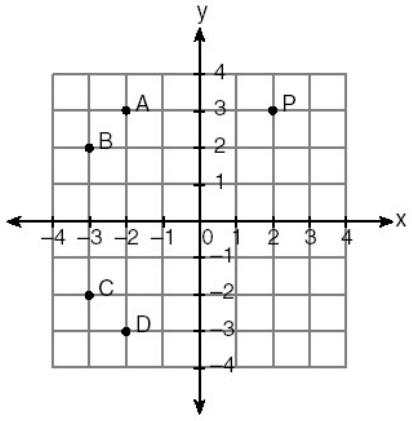


Which shape would the spinning flag create?

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

4

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

5

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) $7 - 2a$

6

Which expression represents the number of yards in x feet?

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

7

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

8

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°

9

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

10

A box in the shape of a cube has a volume of 64 cubic inches. What is the length of a side of the box?

(1) $21.\overline{3}$ in
(2) 16 in
(3) 8 in
(4) 4 in

11

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) $2d - 20$

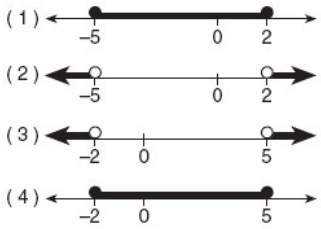
12

A farmer has a rectangular field that measures 100 feet by 150 feet. He plans to increase the area of the field by 20%. He will do this by increasing the length and width by the same amount, x. Which equation represents the area of the new field?

(1) $(100 + 2x)(150 + x) = 18{,}000$
(2) $2(100 + x) + 2(150 + x) = 15{,}000$
(3) $(100 + x)(150 + x) = 18{,}000$
(4) $(100 + x)(150 + x) = 15{,}000$

13

Which graph represents the solution set for the expression $|2x + 3| > 7$?



14

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

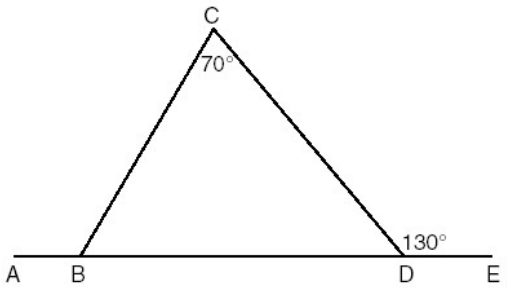
(1) 0 < a < 1
(2) a < 1
(3) a ≥ 1
(4) a > 1

15

A wheel has a radius of 5 feet. What is the minimum number of *complete* revolutions that the wheel must make to roll at least 1,000 feet?

16

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 $m\angle CBA$.

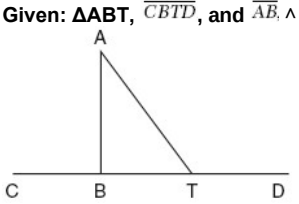


17

Kyoko's mathematics teacher gave her the accompanying cards and asked her to arrange the cards in order from least to greatest. In what order should Kyoko arrange the cards?

18

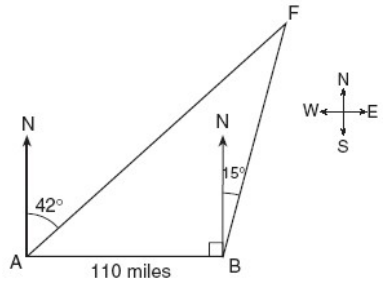
Given: ΔABT, $\overline{CBTD}$, and $\overline{AB} \perp \overline{CD}$



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

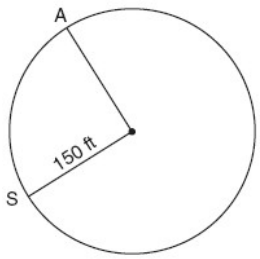
19

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?



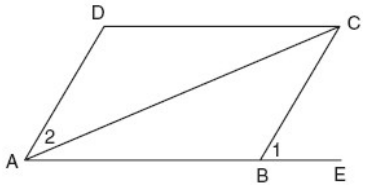
20

Kathy and Tami are at point A on a circular track that has a radius of 150 feet, as shown in the accompanying diagram. They run counterclockwise along the track from A to S, a distance of 247 feet. Find, to the *nearest degree*, the measure of minor arc AS.



21

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



Prove: m∠1 > m∠2