

# GEOMETRY ANSWERS

## ACTIVITIES 11 - 15



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## SOL G.1b and c - Geometry Formative Assessment

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### Question #1

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Erin made the following statements.

If it is not sunny on Saturday, I will not go to the beach.

If I do not go to the beach, I will not play volleyball.

Which of the following conclusions can be drawn?

- A If Erin played volleyball, then it was not sunny on Saturday.
- B If it was sunny on Saturday, then Erin played volleyball.
- C If Erin did not play volleyball, then it was not sunny on Saturday.
- D If it was not sunny on Saturday, then Erin did not play volleyball.

### Question #2

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Which is a correct example of deductive reasoning?

- A Gilbert has scored 90 or above on his last 8 exams. Gilbert will score a 90 on his 9th exam.
- B All rectangles are quadrilaterals. All squares are rectangles. Therefore, all squares are quadrilaterals.
- C Robert has won a prize for every contest he entered. Robert will win a prize on the next contest he enters.
- D All rhombuses are quadrilaterals. All trapezoids are quadrilaterals. Therefore, all rhombuses are trapezoids.

## Question #3

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Let  $r \rightarrow s$  represent the statement below.

If a portrait is of the principal, then it will hang in the school library.

Which statement is equivalent to  $\sim r \rightarrow \sim s$ ?

- A If the portrait hangs in the school library, then it is not of the principal.
- B If the portrait is not of the principal, then it will hang in the school library.
- C If the portrait is not of the principal, then it will not hang in the school library.
- D If the portrait does not hang in the school library, then it is not of the principal.

## Question #4

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Given:

- An engine will not run without electricity.
- The engine does not run.

Which statement is a valid conclusion?

- A The engine will never run.
- B The engine does not have electricity.
- C Every engine needs electricity to run.
- D There is no valid conclusion.

## Question #5

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**Which argument is valid?**

- I If  $RQST$  is a rhombus, then  $RQST$  is a kite.  
 $RQST$  is a rhombus.  
Therefore,  $RQST$  is a kite.
- II If  $RQST$  is a rhombus, then  $RQST$  is a kite.  
 $RQST$  is not a rhombus.  
Therefore,  $RQST$  is not a kite.
- III If  $RQST$  is a rhombus, then  $RQST$  is a kite.  
 $RQST$  is a kite.  
Therefore,  $RQST$  is a rhombus.
- IV If  $RQST$  is a rhombus, then  $RQST$  is a kite.  
 $RQST$  is not a kite.  
Therefore,  $RQST$  is a rhombus.

- A I
- B II
- C III
- D IV

## Question #6

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Let  $p \rightarrow q$  represent the statement below.

**If the grass is wet, then it rained or someone ran a sprinkler.**

**Which statement is logically equivalent to the statement  $\sim q \rightarrow \sim p$ ?**

- (A) If it rained or someone ran a sprinkler, then the grass is wet.
- (B) If it did not rain or someone did not run a sprinkler, then the grass is wet.
- (C) If the grass is not wet, then it did not rain and someone did not run a sprinkler.
- (D) If it did not rain and someone did not run a sprinkler, then the grass is not wet.

## Question #7

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**Read the following information.**

- **If students are late to school 3 times, they receive an after-school detention.**
- **Tom was late to school on October 1st, November 10th, and again on December 4th.**

**Using deductive reasoning, choose the appropriate conclusion based upon the given information.**

- (A) Tom will never be late again.
- (B) Tom will be late in January.
- (C) Tom will receive an after-school detention.
- (D) Tom is a good student.

## Question #8

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**Dan made the following statements.**

If I do not baby-sit on Friday, I will not make \$10.

If I do not make \$10, then I will not go to the movies on Saturday.

**Which of the following conclusions can be drawn?**

- A** If Dan did not baby-sit on Friday, then he did not go to the movies on Saturday.
- B** If Dan baby-sat on Friday, then he went to the movies on Saturday.
- C** If Dan did not go to the movies on Saturday, then he did not baby-sit on Friday.
- D** If Dan went to the movies on Saturday, then he did not baby-sit it on Friday.

## Question #9

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**Which is a correct example of deductive reasoning?**

- A** Albert has won the last 6 games of chess. Albert will win the 7th game of chess.
- B** All football players are fast. Steve is fast. Therefore, Steve is a football player.
- C** All dogs are mammals. All mammals are vertebrates. Therefore, all dogs are vertebrates.
- D** Every car Dana has seen has two people in it. The next car Dana sees will have two people in it.

## Question #10

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For the true statement “If point  $M$  is the midpoint of segment  $BC$ , then segment  $BM$  is congruent to segment  $CM$ .”

Let  $P =$  Point  $M$  is the midpoint of segment  $BC$ .

Let  $Q =$  Segment  $BM$  is congruent to segment  $CM$ .

Which set of conditional statements are both always true?

A  $P \rightarrow Q$  and  $Q \rightarrow P$

B  $P \rightarrow Q$  and  $\sim P \rightarrow \sim Q$

C  $Q \rightarrow P$  and  $\sim P \rightarrow \sim Q$

D  $P \rightarrow Q$  and  $\sim Q \rightarrow \sim P$  ✓

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## SOL G.3a - Geometry Formative Assessment

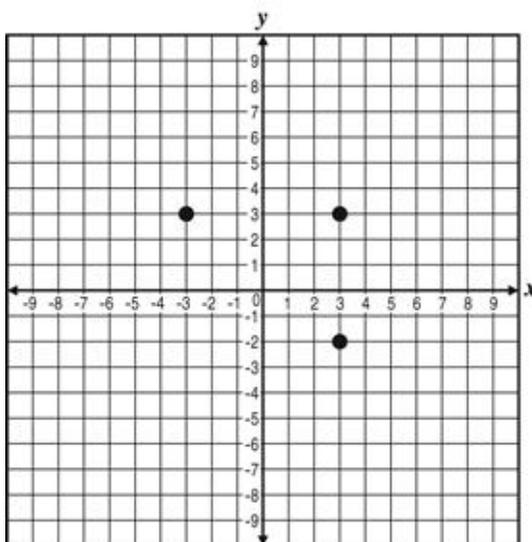
### Question #1

What is the midpoint of the segment joining  $(2, 6)$  and  $(10, 12)$ ?

- A  $(5, 6)$        B  $(1, 3)$   
 C  $(6, 9)$        D  $(12, 18)$

### Question #2

Blanca drew 3 vertices of a rectangle on the coordinate plane.



Which of the following could be the coordinates for the fourth vertex of the rectangle?

- A  $(-3, -2)$        B  $(-3, 2)$   
 C  $(-2, 3)$        D  $(-2, -3)$

### Question #3

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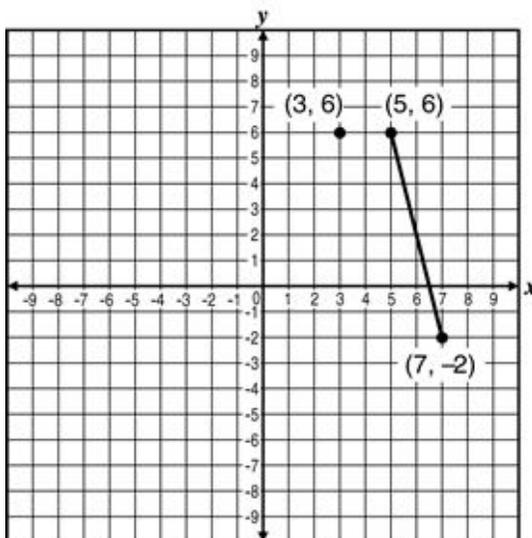
Point  $M$  is the midpoint of line segment  $\overline{BC}$ . If the coordinates of  $M$  are  $(-1, 1)$  and the coordinates of  $B$  are  $(3, 4)$ , find the coordinates of Point  $C$ .

- A  $(-5, -2)$   B  $(7, 7)$   
 C  $(2, 5)$   D  $(1, \frac{5}{2})$

### Question #4

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What is the distance between Point  $(3, 6)$  and the midpoint of the line segment connecting Points  $(5, 6)$  and  $(7, -2)$ ?



- A 3  B 5  
 C 9  D 25

## Question #5

The coordinates of Point  $J$  are  $(1, 6)$ , the coordinates of Point  $U$  are  $(8, 10)$ , and the coordinates of Point  $P$  are  $(-6, -3)$ . What coordinates of Point  $M$  would make  $JUMP$  a parallelogram?

(A)  $(2, 3)$

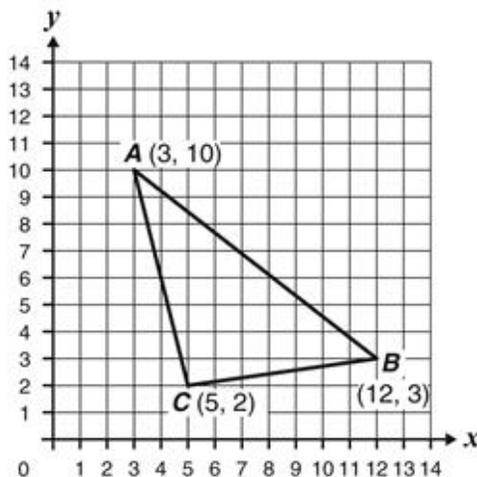
(B)  $(1, 3\frac{1}{2})$

(C)  $(4, 1)$

(D)  $(1, 1)$  ✓

## Question #6

Triangle  $ABC$  is shown on this grid.



What are the coordinates of the endpoints of the midsegment of  $\triangle ABC$  that is parallel to  $\overline{CB}$ ?

(A)  $(4, 6), (8, 6)$

(B)  $(4, 6), (7.5, 6.5)$  ✓

(C)  $(6, 4), (8, 6)$

(D)  $(6, 4), (6.5, 7.5)$

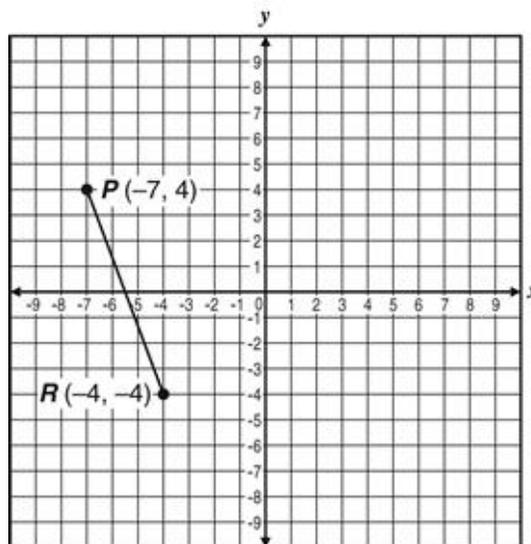
## Question #7

Which expression represents the distance between points  $(1, 1)$  and  $(-1, -1)$ ?

- A  $\sqrt{(-1 - (-1))^2 + (-1 - (-1))^2}$ 
 B  $\sqrt{(-1 - 1)^2 + (-1 - 1)^2}$
- C  $\sqrt{(1 - 1)^2 + (-1 - 1)^2}$ 
 D  $\sqrt{(-1 - 1)^2 + (1 - 1)^2}$

## Question #8

Line segment  $PR$  is graphed below.

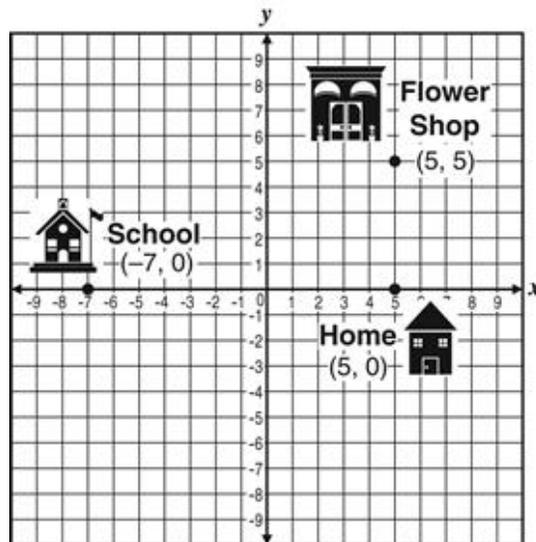


If  $\overline{PR}$  is one side of Parallelogram  $PRST$ , which coordinate pairs could represent vertices  $S$  and  $T$ ?

- A  $(6, 9)$  and  $(4, 1)$ 
 B  $(7, 3)$  and  $(5, 11)$
- C  $(9, 2)$  and  $(6, 10)$ 
 D  $(10, 11)$  and  $(7, 3)$

## Question #9

David departs from his home and travels directly to a flower shop and then directly to school. The locations are shown on the grid below, where each unit represents 1 mile.

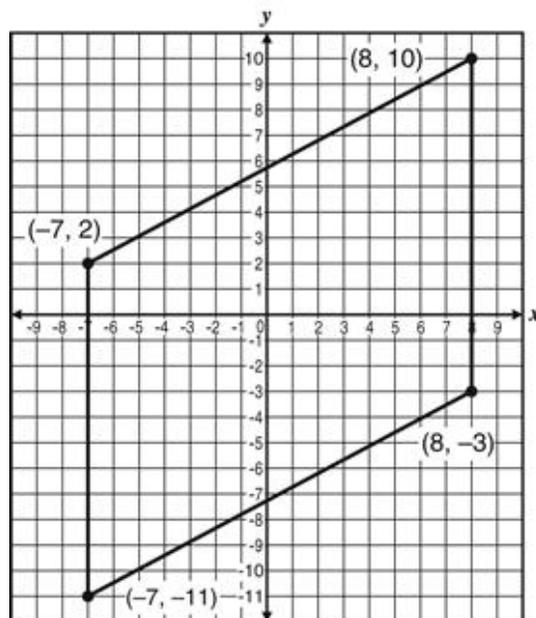


What is the shortest distance between the flower shop and the school?

- A 5 miles
- B 12 miles
- C 13 miles
- D 18 miles

## Question #10

The figure graphed below is a parallelogram.



What is the perimeter of the parallelogram?

(A) 56 units

(B) 60 units

(C) 70 units

(D) 72 units

## Question #11

The vertices of a certain parallelogram are  $(-3, 3)$ ,  $(-2, -2)$ ,  $(4, -1)$ , and  $(x, 4)$ . What is the value of  $x$  in the last ordered pair?

(A) -2

(B) -1

(C) 3

(D) 4

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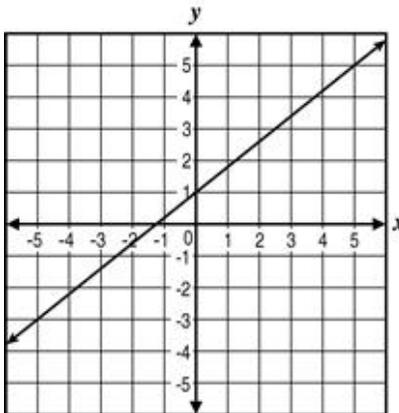
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## SOL G.3b - Geometry Formative Assessment

### Question #1

Which table of ordered pairs BEST represents a line that is parallel to the line shown in the graph?



(A)

x	y
-5	6
5	-2

(B)

x	y
-4	1
4	-9

(C)

x	y
-4	0
4	10

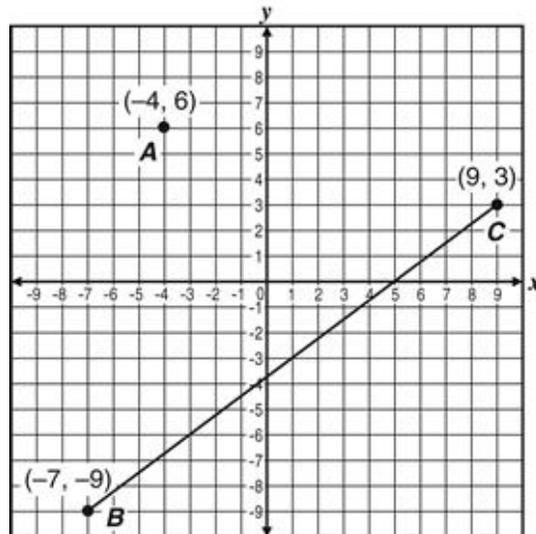
(D)

x	y
-5	-5
10	7



## Question #2

The grid below shows the location of train stations  $A$ ,  $B$ , and  $C$  in a coordinate system. A straight track connects stations  $B$  and  $C$ , as shown.



Another straight track will connect a fourth station,  $D$ , to station  $A$ . This track will intersect the track between stations  $B$  and  $C$  at a right angle. Which coordinate pair could represent the location of station  $D$ ?

- A (4, -6)
- B (4, -10)
- C (8, -3)
- D (8, -10)

## Question #3

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Select all the equations that represent lines parallel to  $y = 6x + 2$ .

A  $y = -\frac{1}{6}x + 7$

-1

B  $y = 6x - 12$

1

C  $12x - 2y = 4$

1

D  $6y = -x - 1$

-1

E  $y = 3x + 2$

-1

## Question #4

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If the graphs of the linear equations shown are perpendicular, what is the value of  $k$ ?

$$y = 7x + 4$$
$$3y = kx - 6$$

A  $-\frac{3}{7}$



B  $-\frac{1}{7}$

C  $\frac{1}{7}$

D  $\frac{3}{7}$

## Question #5

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Select all the equations that represent lines parallel to  $y = 3x - 4$ .

- A  $3x - y = 6$  1
- B  $3y = 9x + 1$  1
- C  $-3y = x + 2$  -1
- D  $\frac{1}{3}y = x - \frac{1}{3}$  1
- E  $y = -\frac{1}{3}x + 5$  -1

## Question #6

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If the graphs of the linear equations shown below are perpendicular, what is the value of  $a$ ?

$$y = 3x + 8$$

$$2y = ax - 5$$

- A  $-\frac{2}{3}$  ✓
- B  $-\frac{1}{3}$
- C  $\frac{1}{3}$
- D  $\frac{2}{3}$

## Question #7

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Select the answer from the menu.

The equations  $y = 7x - 2$  and  $14x - 2y = 3$  represent

parallel lines



## Question #8

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Select the answer from the menu.

The line  $3x + y = 2$  is

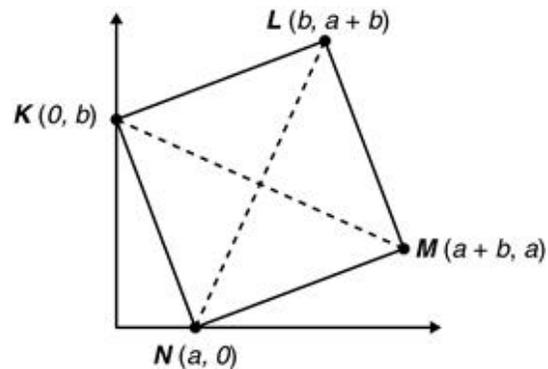
parallel to



the line  $6x + 2y = 14$ .

## Question #9

Square  $KLMN$  with its vertices is shown below.



Which equation can be used to justify the diagonals  $\overline{LN}$  and  $\overline{KM}$  are perpendicular?

(A)  $\left(\frac{a+b}{b-a}\right)\left(\frac{a-b}{a+b}\right) = 1$

(B)  $\left(\frac{a+b}{b-a}\right)\left(\frac{b-a}{a+b}\right) = 1$

(C)  $\left(\frac{a+b}{b-a}\right)\left(\frac{a-b}{a+b}\right) = -1$

(D)  $\left(\frac{a+b}{b-a}\right)\left(\frac{b-a}{a+b}\right) = -1$

## Question #10

If the coefficient of  $x$  is changed to  $-\frac{1}{3}$  in the equation  $y = 3x - 2$ , which statement BEST describes how the graph of the equation will be affected?

(A) The graph of the new line will shift 3 units below the graph of the original line.

(B) The graph of the new line will shift 1 unit below the graph of the original line.

(C) The graph of the new line will be perpendicular to the graph of the original line.

(D) The graph of the new line will be parallel to the graph of the original line.



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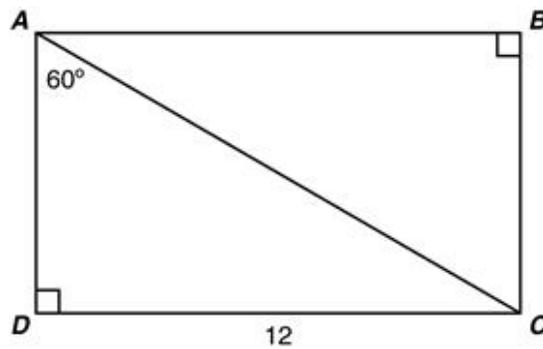
## SOL G.8b - Geometry Formative Assessment

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### Question #1

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Rectangle  $ABCD$  is shown below with the dimensions given in units.



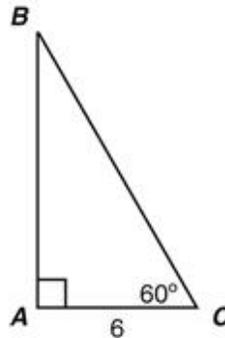
What is  $AC$  in units?

- A  $8\sqrt{3}$   B  $12\sqrt{2}$
- C  $12\sqrt{3}$   D 24

## Question #2

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What is the length of  $\overline{BC}$  in Triangle  $ABC$ ?



A 3 units

B 6 units

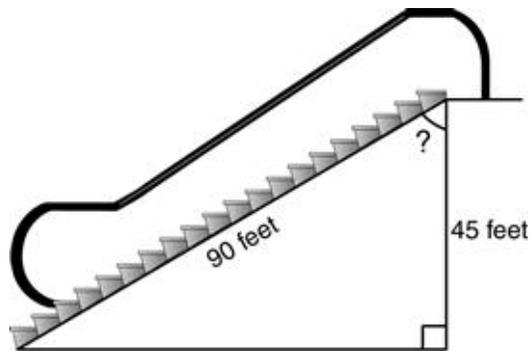
C 9 units

D 12 units

## Question #3

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A 90-foot escalator rises a vertical distance of 45 feet, as shown in the diagram below.



What is the measure of the angle identified with a question mark in the diagram?

A  $30^\circ$

B  $45^\circ$

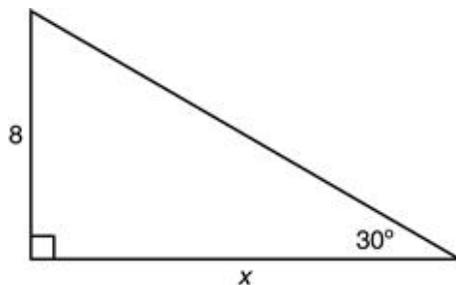
C  $60^\circ$

D  $90^\circ$

## Question #4

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A right triangle with dimensions given in units is shown below.



What is the value of  $x$  in units?

(A)  $4\sqrt{2}$

(B)  $4\sqrt{3}$

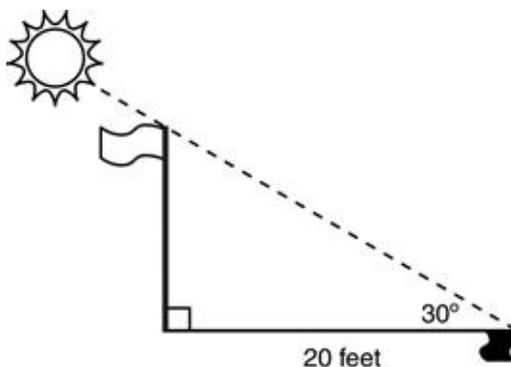
(C)  $8\sqrt{2}$

(D)  $8\sqrt{3}$  ✓

## Question #5

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A flagpole cast a 20-foot shadow on the ground perpendicular to its base. The angle of elevation from the end of the shadow to the top of the flagpole is  $30^\circ$  as shown in the diagram.



Which measurement is closest to the height, in feet, of the flagpole?

(A) 10

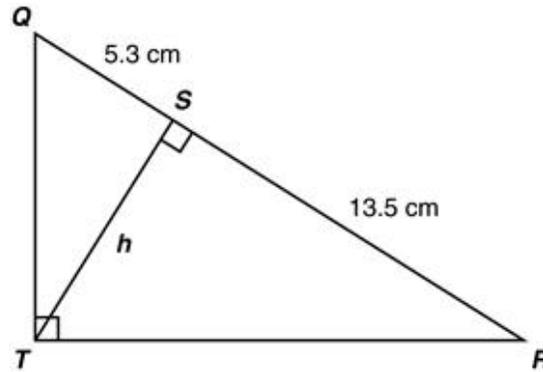
(B) 11.5 ✓

(C) 20

(D) 23.1

## Question #6

Right triangles  $TSQ$  and  $TSR$  represent two pieces of fabric that are joined together on a quilt to form a larger right triangle.



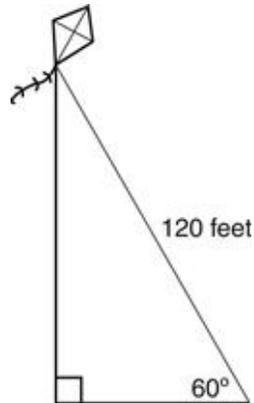
Which equation BEST represents  $h$ , the length of the seam joining the two pieces of fabric in centimeters?

- A  $h = \sqrt{13.5 - 5.3} \approx 2.9$
- B  $h = \sqrt{5.3 + 13.5} \approx 4.3$
- C  $h = \sqrt{5.3 \cdot 13.5} \approx 8.5$
- D  $h = \sqrt{13.5^2 - 5.3^2} \approx 12.4$

## Question #7

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A kite is on a string as shown in the figure below.



The string makes an angle of  $60^\circ$  with the ground. If the length of the string is 120 feet, what is the height of the kite above the ground, in feet?

(A) 60

(B)  $60\sqrt{3}$  ✓

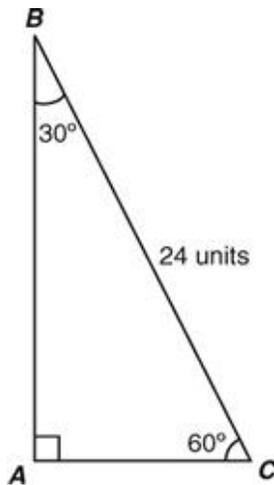
(C) 120

(D)  $120\sqrt{3}$

## Question #8

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What is the length of  $\overline{AC}$  in the figure below?



- A 8 units
- C 14.4 units

- B 12 units
- D 20.8 units

## Question #9

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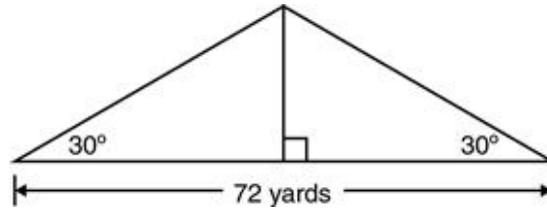
An 18-foot ladder is leaning against the side of a building forming a right triangle. The angle formed by the ladder and the ground is  $60^\circ$ . Which is closest to the distance, in feet, of the bottom of the ladder from the base of the wall?

- A 9
- B 10.4
- C 12.7
- D 15.6

## Question #10

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A roof support is built according to the diagram shown below.



What is the height of the roof in yards?

(A) 18

(B)  $12\sqrt{3}$  ✓

(C)  $18\sqrt{2}$

(D) 36

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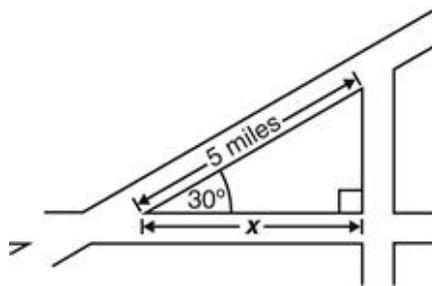
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## SOL G.8c - Geometry Formative Assessment

### Question #1

Three roads intersect to form a large triangular area as shown below.



What is the length, to the nearest tenth of a mile, of side  $x$  of the triangle?

(A) 2.5 miles

(B) 2.9 miles

(C) 4.0 miles

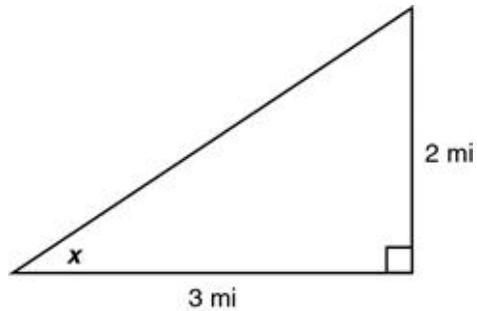
(D) 4.3 miles



## Question #2

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Sid drove from his home to the museum. He drove 2 miles (mi) due south and then 3 mi due west. This situation is represented by the figure shown below.

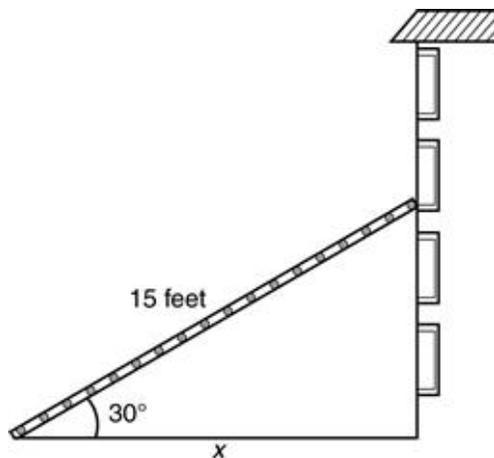


Which value is closest to the measure of the angle represented by  $x$ ?

- A  $34^\circ$   B  $42^\circ$
- C  $48^\circ$   D  $56^\circ$

## Question #3

A 15-foot conveyor belt for raising and lowering supplies is leaning against a building at a  $30^\circ$  angle with the ground, as shown.



Which trigonometric equation could be used to find  $x$ , the distance, in feet, from the base of the conveyor belt to the building?

A  $x = 15 \sin 30^\circ$

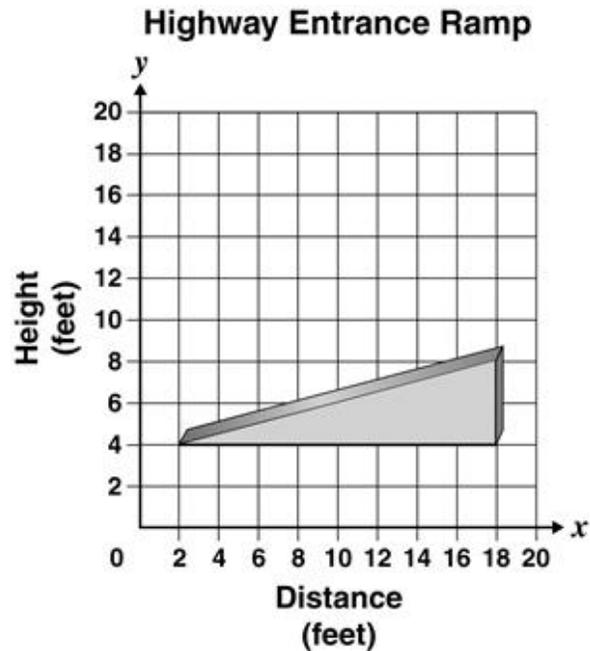
B  $x = \frac{\sin 30^\circ}{15}$

C  $x = 15 \cos 30^\circ$

D  $x = \frac{15}{\cos 30^\circ}$

## Question #4

A highway entrance ramp rises 4 feet above a horizontal road over a distance of 16 feet, as shown below.

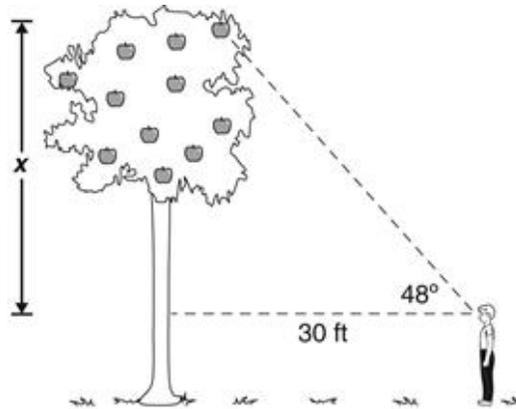


Which equation can be used to determine the angle formed by the horizontal road and the entrance ramp?

- A  $\tan x = \frac{4}{16}$
- B  $\tan x = \frac{16}{4}$
- C  $\sin x = \frac{4}{16}$
- D  $\sin x = \frac{16}{4}$

## Question #5

Tom is  $5\frac{1}{2}$  feet tall. If Tom stands 30 feet from the base of an apple tree looking up at an apple in the tree at an angle of sight of  $48^\circ$ , how far is the apple from the ground?



Note: Figure is not drawn to scale.

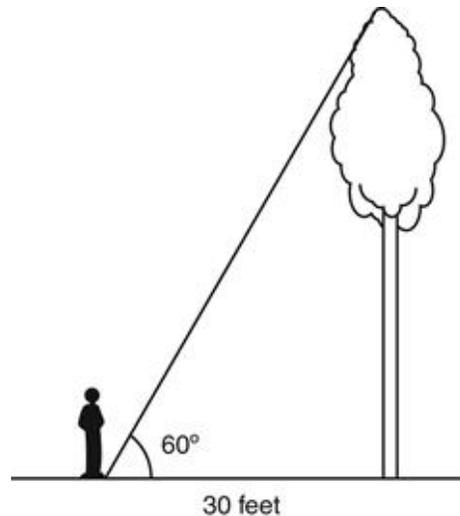
- A 25.6 feet
- C 33.2 feet

- B 27.8 feet
- D 38.8 feet

## Question #6

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Brad stands 30 feet from a tree. He estimates the angle of elevation from a point on the ground 30 feet from the tree to the top of the tree to be  $60^\circ$  as shown below.



Which of the following is closest to the height of the tree?

- A 15 feet
- B 30 feet
- C 52 feet
- D 60 feet

## Question #7

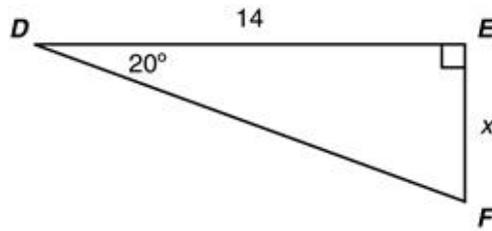
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A camp tent has a center pole 5 feet high. The sides of the tent make an angle of  $55^\circ$  with the ground. How wide is the tent?

- A 3.5 feet
- B 5.7 feet
- C 7 feet
- D 14.2 feet

## Question #8

Right triangle  $DEF$  is shown below with the dimensions given in units.



Which measurement is closest to the value of  $x$  in units?

(A) 4.8

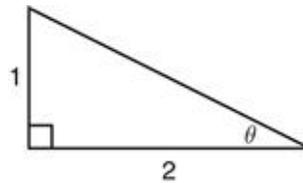
(B) 5.1

(C) 13.2

(D) 14.9

## Question #9

In the figure below, what is the  $\sin \theta$ ?



(A)  $\sqrt{5}$

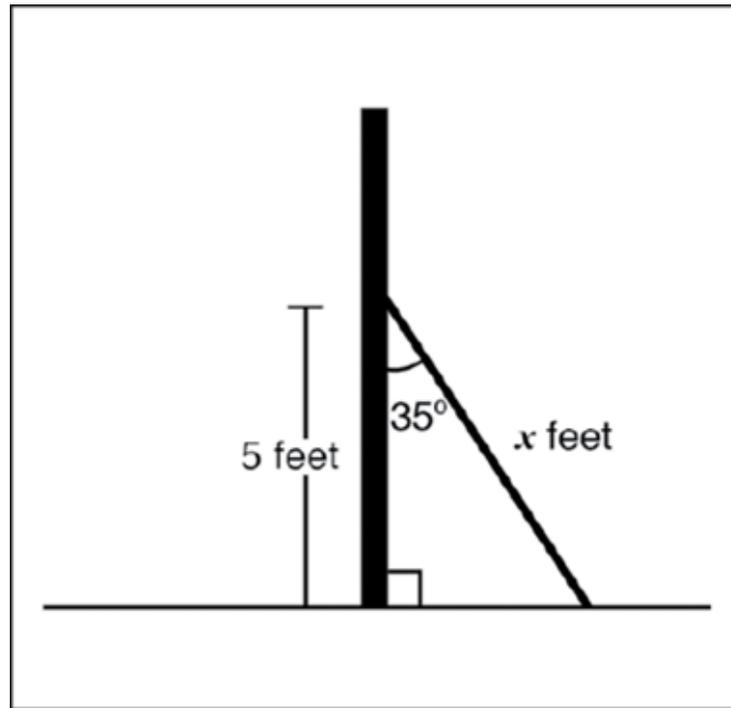
(B)  $\frac{\sqrt{5}}{2}$

(C)  $\frac{\sqrt{5}}{5}$

(D)  $\frac{2\sqrt{5}}{5}$

## Question #10

A set designer is placing a support beam against a moveable background to ensure that the background remains at a  $90^\circ$  angle to the ground. The beam will be fixed to the background 5 feet above the floor at a  $35^\circ$  angle, as shown.



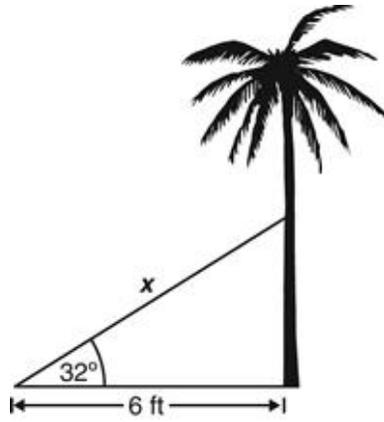
Complete the equations to show two ways to solve for  $x$ , the length of the support beam.

$\cos$      $\sin$

## Question #11

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A guide wire for a palm tree makes a  $32^\circ$  angle with the ground and is staked 6 feet from the base of the tree, as shown below.



What is the length, to the nearest tenth of a foot, of the guide wire from the ground to the palm tree?

- A 7.1 feet
- B 8.5 feet
- C 9.6 feet
- D 11.3 feet