

**VIRGINIA**  
**STANDARDS OF LEARNING ASSESSMENTS**

**Spring 2001 Released Test**

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**END OF COURSE**  
**GEOMETRY**

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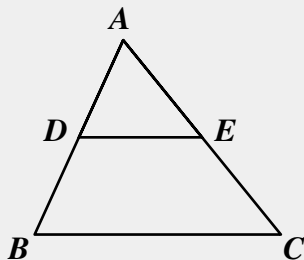
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## Geometry

### DIRECTIONS

Read and solve each question. Then mark the space on the answer sheet for the best answer.

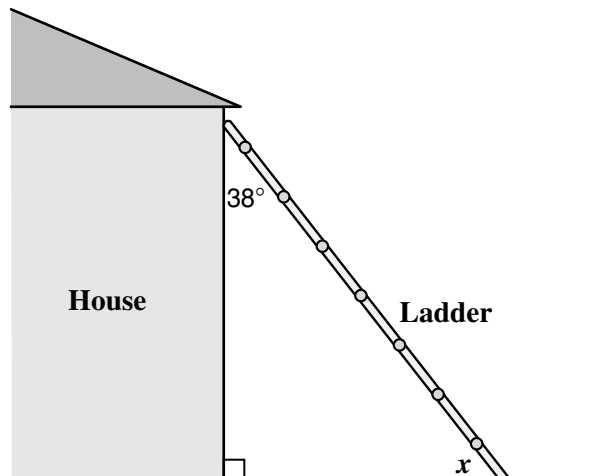
#### SAMPLE



If  $\triangle ABC$  is similar to  $\triangle ADE$ , then  $AB : AD = ? : AE$ . Which replaces the “?” to make the statement true?

- A AC
- B AE
- C DE
- D BC

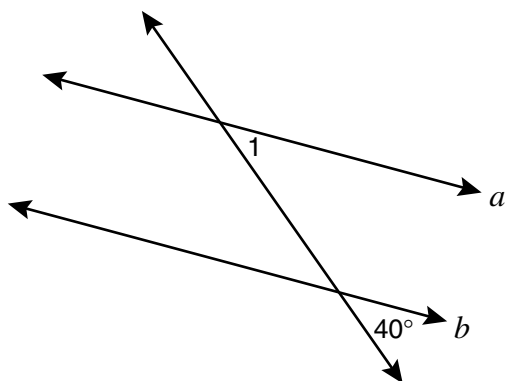
- 2 A ladder is leaning against a house at an angle of  $38^\circ$  as shown in the diagram.



What is the measure of the angle,  $x$ , between the ladder and the ground?

- F  $38^\circ$
- G  $42^\circ$
- H  $52^\circ$
- J  $142^\circ$

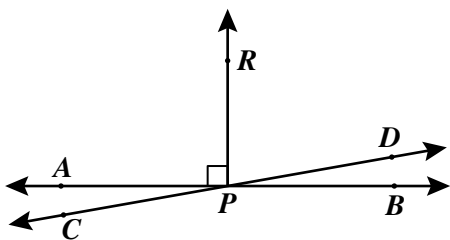
1



If line  $a$  is parallel to line  $b$ , what is  $m\angle 1$ ?

- A  $40^\circ$
- B  $50^\circ$
- C  $90^\circ$
- D  $140^\circ$

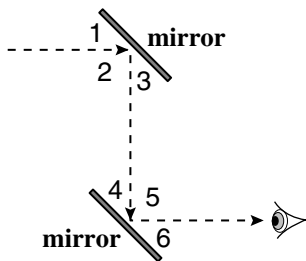
- 3 Lines  $AB$  and  $CD$  intersect at  $P$ .  $\overrightarrow{PR}$  is perpendicular to  $\overleftrightarrow{AB}$ , and  $m\angle APD = 170^\circ$ .



What is the measure  $\angle DPB$ ?

- A  $10^\circ$
- B  $20^\circ$
- C  $30^\circ$
- D  $40^\circ$

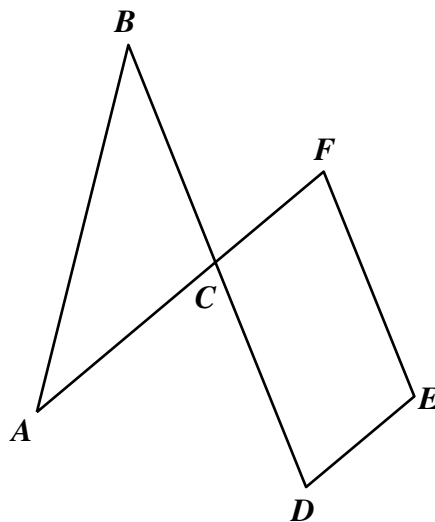
4



This diagram shows how a periscope works. If the two mirrors are parallel and  $\angle 1 \cong \angle 3$ , what is  $m\angle 6$  when  $m\angle 2 = 90^\circ$ ?

- F  $30^\circ$
- G  $45^\circ$
- H  $50^\circ$
- J  $60^\circ$

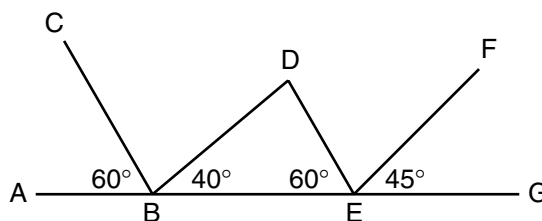
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Sides  $\overline{BC}$  and  $\overline{AC}$  of  $\triangle ABC$  are extended to form 2 sides of parallelogram  $CDEF$ .  $\angle CAB$  and  $\angle CBA$  each measure  $36^\circ$ . What is the measure of  $\angle CFE$ ?

- A  $36^\circ$
- B  $54^\circ$
- C  $72^\circ$
- D  $108^\circ$

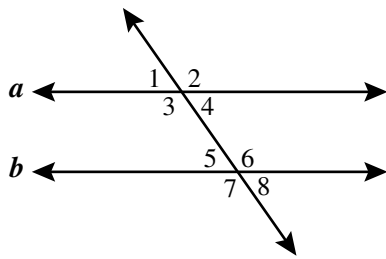
6



Using the information on the diagram, which is true?

- F  $\overline{BD} \parallel \overline{EF}$
- G  $\overline{BD} \parallel \overline{DE}$
- H  $\overline{CB} \parallel \overline{BD}$
- J  $\overline{CB} \parallel \overline{DE}$

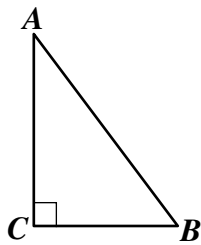
7



Line  $a$  is parallel to line  $b$  if —

- A  $m\angle 4 = m\angle 2$
- B  $m\angle 3 = m\angle 5$
- C  $m\angle 4 = m\angle 5$
- D  $m\angle 3 = m\angle 2$

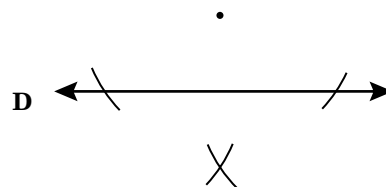
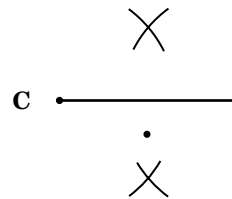
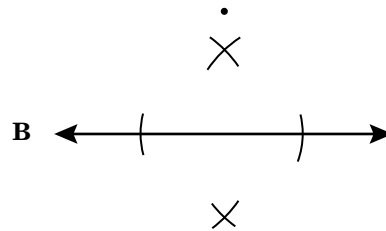
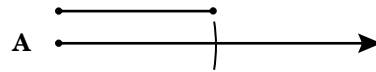
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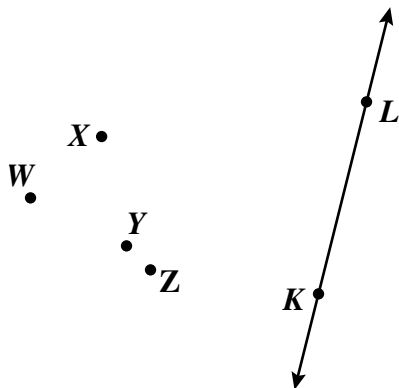
Triangle  $ABC$  is a right triangle with the right angle at  $C$ . Which are possible measures for angle  $A$  and angle  $B$ ?

- F  $48^\circ$  and  $50^\circ$
- G  $38^\circ$  and  $32^\circ$
- H  $52^\circ$  and  $38^\circ$
- J  $52^\circ$  and  $128^\circ$

9 Which drawing shows the arcs for a construction of a perpendicular to a line from a point not on the line?

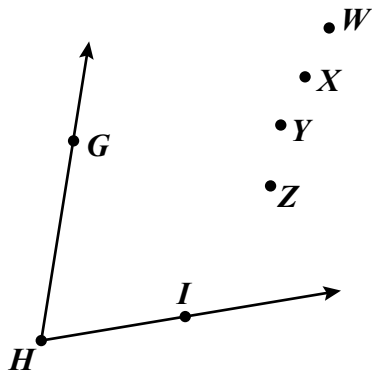


- 10 Use your compass and straightedge to construct a line that is perpendicular to  $\overleftrightarrow{KL}$  and passes through point  $K$ .



Which point lies on this perpendicular?

- F W
  - G X
  - H Y
  - J Z
- 11 Use your compass and straightedge to construct the bisector of  $\angle GHI$ .



Which point lies on this bisector?

- A W
- B X
- C Y
- D Z

- 12 Which conclusion logically follows the true statements?

“If negotiations fail, the baseball strike will not end.”

“If the baseball strike does not end, the World Series will not be played.”

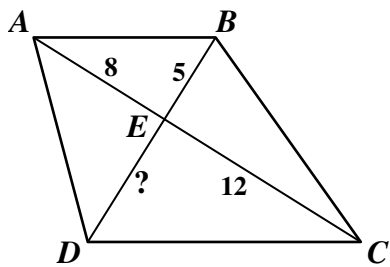
- F If the baseball strike ends, the World Series will be played.
- G If negotiations do not fail, the baseball strike will not end.
- H If negotiations fail, the World Series will not be played.
- J If negotiations fail, the World Series will be played.

- 13 Let  $a$  represent “ $x$  is an odd number.”  
Let  $b$  represent “ $x$  is a multiple of 3.”

When  $x$  is 7, which of the following is true?

- A  $a \wedge b$
- B  $a \wedge \sim b$
- C  $\sim a \wedge b$
- D  $\sim a \wedge \sim b$

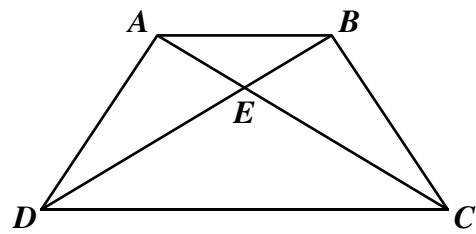
14



In the figure,  $AE = 8$ ,  $CE = 12$ , and  $BE = 5$ . What value for the measure of  $\overline{DE}$  would make  $\triangle ABE$  similar to  $\triangle CDE$ ?

- F 3.3
- G 7.5
- H 8
- J 15

15

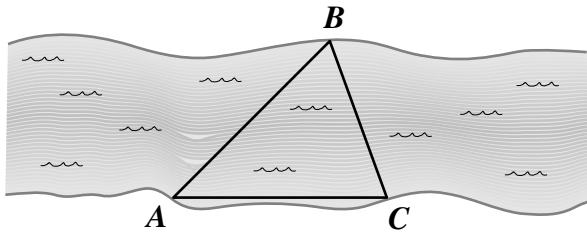


Given:  $\overline{AC} \cong \overline{BD}$   
 $\overline{AD} \cong \overline{BC}$

Which could be used to prove  $\triangle DCA \cong \triangle CDB$ ?

- A (SSS) If 3 sides of one triangle are congruent to 3 sides of another triangle, then the triangles are congruent.
- B (SAS) If 2 sides and the angle between them in one triangle are congruent to 2 sides and the angle between them in another triangle, then the triangles are congruent.
- C (ASA) If 2 angles and the side between them of one triangle are congruent to 2 angles and the side between them of another triangle, then the triangles are congruent.
- D (AAS) If 2 angles and a side not between them are congruent to 2 angles and a side not between them of another triangle, then the triangles are congruent.

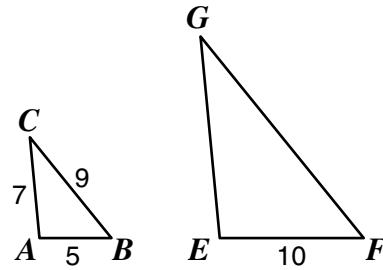
- 16 On the shores of a river, surveyors marked locations,  $A$ ,  $B$ , and  $C$ . The measure of  $\angle ACB = 70^\circ$ , and the measure of  $\angle ABC = 65^\circ$ .



Which lists the distances between these locations in order, least to greatest?

- F A to B, B to C, A to C
- G B to C, A to B, A to C
- H B to C, A to C, A to B
- J A to C, A to B, B to C

- 17 Triangles  $ABC$  and  $EFG$  are similar with measurements as shown.



What is the ratio  $\frac{AC}{EG}$ ?

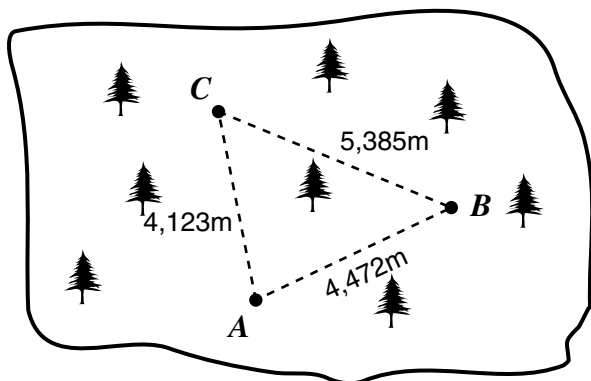
- A  $\frac{1}{2}$
- B  $\frac{5}{7}$
- C  $\frac{7}{10}$
- D  $\frac{7}{9}$

- 18 Which of the following could be the lengths of the sides of  $\triangle ABC$ ?

- F  $AB = 12$ ,  $BC = 15$ ,  $AC = 2$
- G  $AB = 9$ ,  $BC = 15$ ,  $CA = 4$
- H  $AB = 150$ ,  $BC = 100$ ,  $CA = 50$
- J  $AB = 10$ ,  $BC = 8$ ,  $AC = 12$



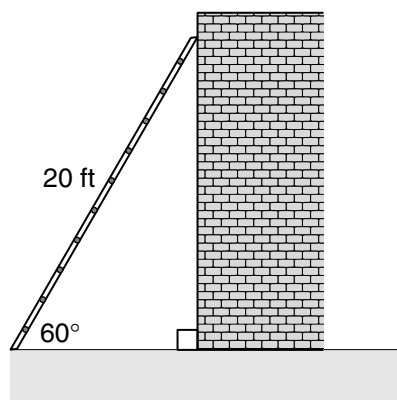
- 19 Three lookout towers are located at points  $A$ ,  $B$ , and  $C$  on the section of a national forest shown in the drawing.



Which of the following statements is true concerning  $\triangle ABC$  formed by the towers?

- A  $m\angle A$  is greatest.
- B  $m\angle C$  is greatest.
- C  $m\angle A$  is least.
- D  $m\angle C$  is least.

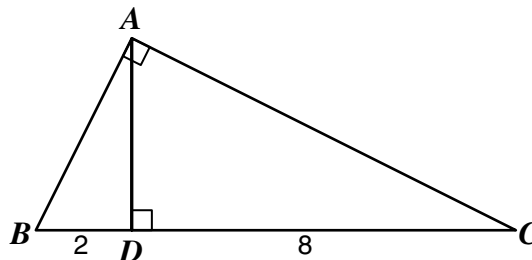
20



A 20-foot ladder leaning against a building makes an angle of  $60^\circ$  with the ground. How far from the base of the building is the foot of the ladder?

- F 5 ft
- G 8.2 ft
- H 10 ft
- J 17.3 ft

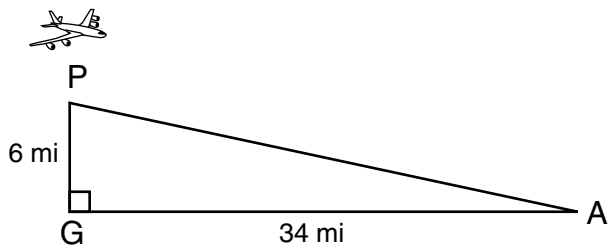
21



In the figure,  $\triangle ABC$  is a right triangle.  $AD$  is perpendicular to  $BC$ , and the measure of  $BD = 2$  meters and  $DC = 8$  meters. What is the measure of  $AC$ ?

- A 2.8 m
- B 4.5 m
- C 8.9 m
- D 10.0 m

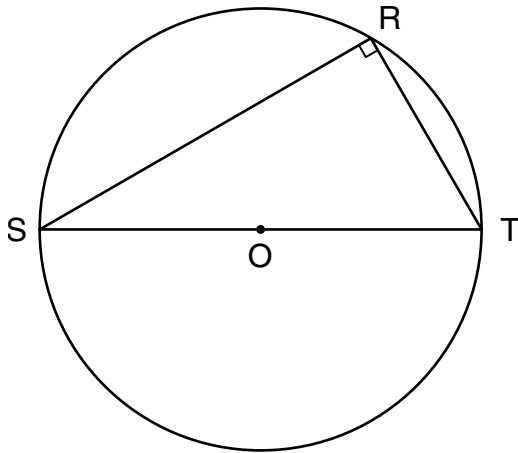
22



An airplane is 34 ground miles from the end of the runway ( $\overline{GA}$ ) and 6 miles high ( $\overline{PG}$ ) when it begins its approach to the airport. To the nearest mile, what is the distance ( $\overline{PA}$ ) from the airplane to the end of the runway?

- F 41 mi
- G 39 mi
- H 37 mi
- J 35 mi

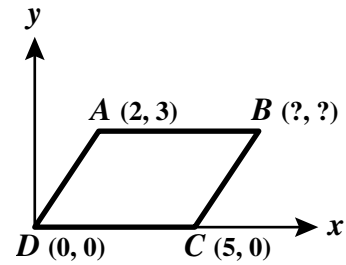
23



In circle  $O$ ,  $\angle RST$  formed by chord  $\overline{RS}$  and diameter  $\overline{ST}$  has a measure of  $30^\circ$ . If the diameter is 12 centimeters, what is the length of chord  $\overline{SR}$ ?

- A  $12\sqrt{3}$  cm
- B  $12\sqrt{2}$  cm
- C  $6\sqrt{3}$  cm
- D  $6\sqrt{2}$  cm

24



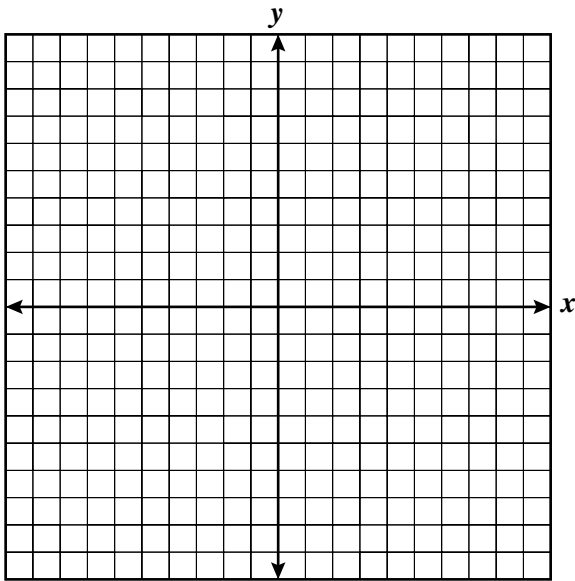
If  $ABCD$  is a parallelogram, what are the coordinates of  $B$ ?

- F (3, 7)
- G (5, 5)
- H (7, 8)
- J (7, 3)

25 Which of the following quadrilaterals could have diagonals that are congruent but do *not* bisect each other?

- A A rhombus
- B A rectangle
- C A parallelogram
- D A trapezoid

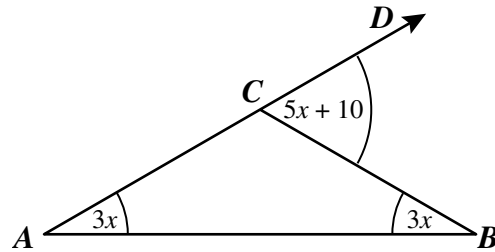
- 26 Three vertices of a square have coordinates  $(5, 1)$ ,  $(2, -2)$ , and  $(-1, 1)$ . You may want to plot the points on this grid.



What are the coordinates of the fourth vertex?

- F  $(-2, 2)$
- G  $(2, -2)$
- H  $(2, 4)$
- J  $(4, 2)$

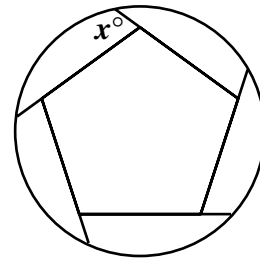
- 27 The figure has angle measures as shown.



What is the measure of  $\angle BCD$ ?

- A  $120^\circ$
- B  $80^\circ$
- C  $60^\circ$
- D  $30^\circ$

28



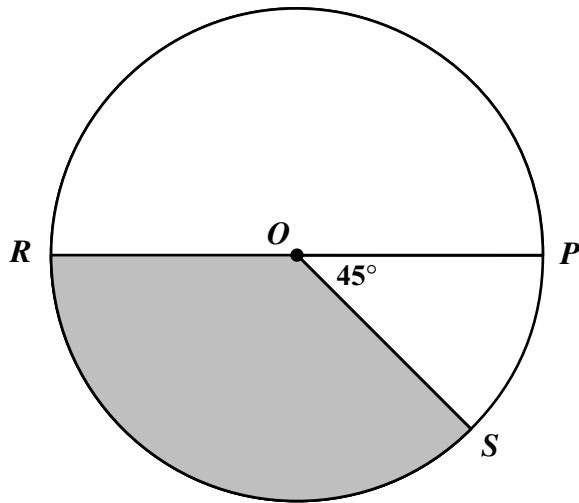
A floor tile is designed with a regular pentagon in the center of the tile with its sides extended. What is the value of  $x$ ?

- F  $72^\circ$
- G  $90^\circ$
- H  $110^\circ$
- J  $120^\circ$

- 29 Each exterior angle of a certain regular polygon measures  $30^\circ$ . How many sides does the polygon have?

A 6  
B 9  
C 10  
D 12

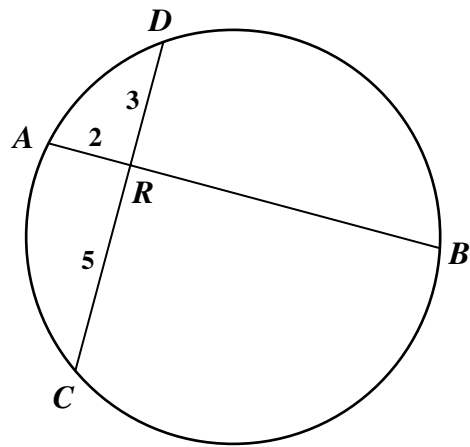
30



A circle for a game spinner is divided into 3 regions as shown.  $\overline{RP}$  is a diameter. What is the area of the shaded sector  $ROS$  if  $RP = 8$ ?

F  $1.5\pi$   
G  $6\pi$   
H  $24\pi$   
J  $72\pi$

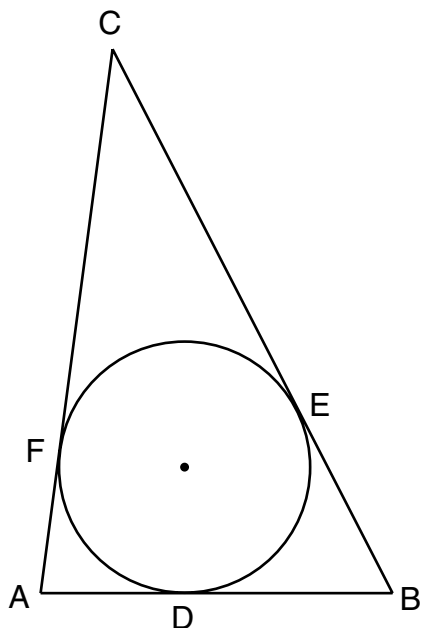
31



Chords  $\overline{AB}$  and  $\overline{CD}$  intersect at  $R$ . Using the values shown in the diagram, what is the measure of  $\overline{RB}$ ?

A 6  
B 7.5  
C 8  
D 9.5

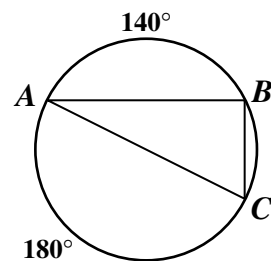
- 32 The logo of an airline is a circle inscribed in a triangle.



If  $AF = 3$  and  $AB = 11$ , then  $BD = \underline{\hspace{1cm}}$ ?

- F 8
- G 10
- H 11
- J 12

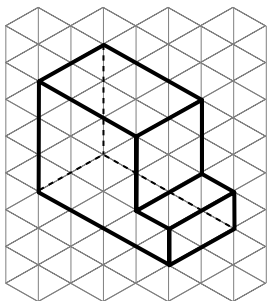
33



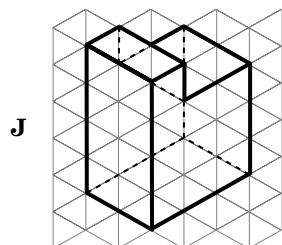
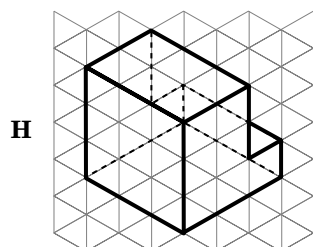
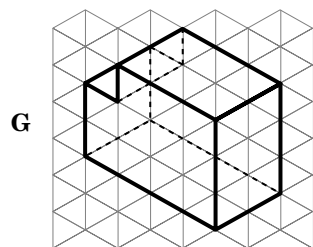
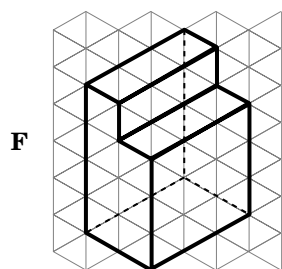
When inscribed in a certain circle,  $\triangle ABC$  intercepts arcs as shown in the diagram. What is the measure of  $\angle BAC$ ?

- A  $90^\circ$
- B  $70^\circ$
- C  $40^\circ$
- D  $20^\circ$

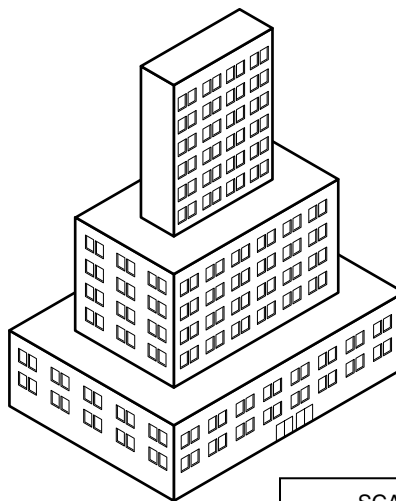
- 34 This is one view of a 3-dimensional object.



Which is a different view of the same object?



35



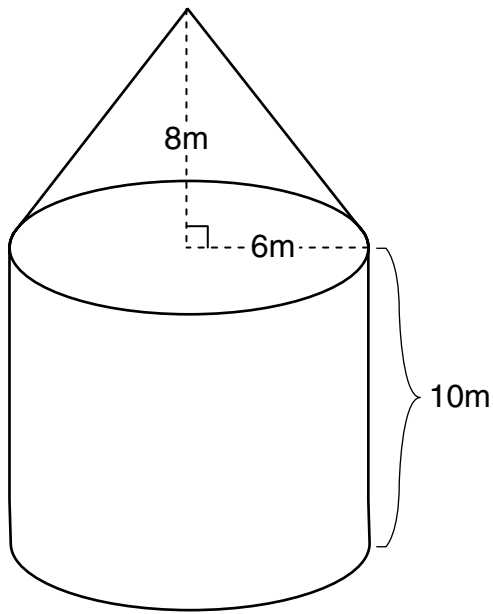
SCALE  
1 cm Represents 13 m

This is a scale drawing of a building.  
What is the actual height of the building?

- A 58.5 m  
B 71.5 m  
C 78 m  
D 84.5 m
- 36 What is the volume in cubic feet of a refrigerator whose interior is 4.5 feet tall, 2.5 feet wide, and 2 feet deep?

- F 15 cu ft  
G 19 cu ft  
H 22.5 cu ft  
J 25 cu ft

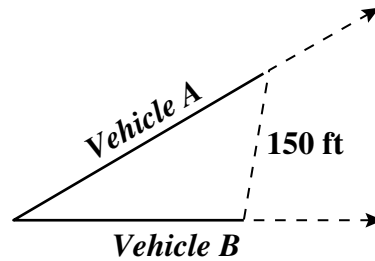
37



Rounded to the nearest hundred cubic meters, what is the total capacity (cone and cylinder) of the storage container?

- A 1,400
- B 2,000
- C 5,700
- D 8,100

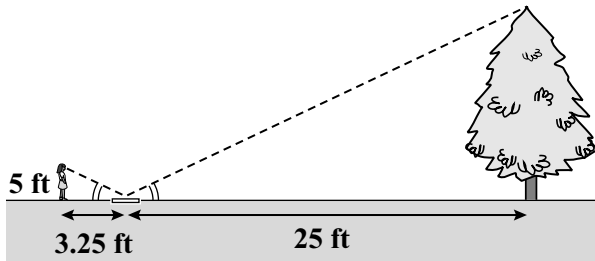
- 38 Two vehicles, each moving from a point in a straight line away from each other at an angle, are 150 feet apart after 6 seconds. Both are moving at a constant rate, vehicle A at 50 feet per second and vehicle B at 40 feet per second.



How far apart are they after 15 seconds?

- F 150 ft
- G 375 ft
- H 600 ft
- J 750 ft

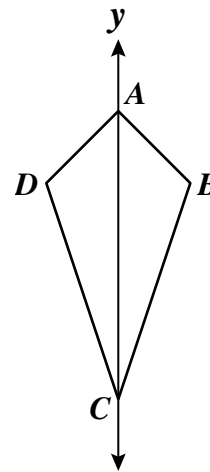
- 39 In order to determine the height of a tree, María places a mirror flat on the ground 25 feet from the base. After backing 3.25 feet, she can just see the top of the tree in the mirror.



María knows that her eyes are exactly 5 feet above ground level and that the angle between her eyes, the mirror, and the ground is the same as the angle between the tree top, the mirror, and the ground. Which is closest to the height of the tree?

- A 24 ft
- B 28 ft 4 in.
- C 38 ft 6 in.
- D 40 ft

40



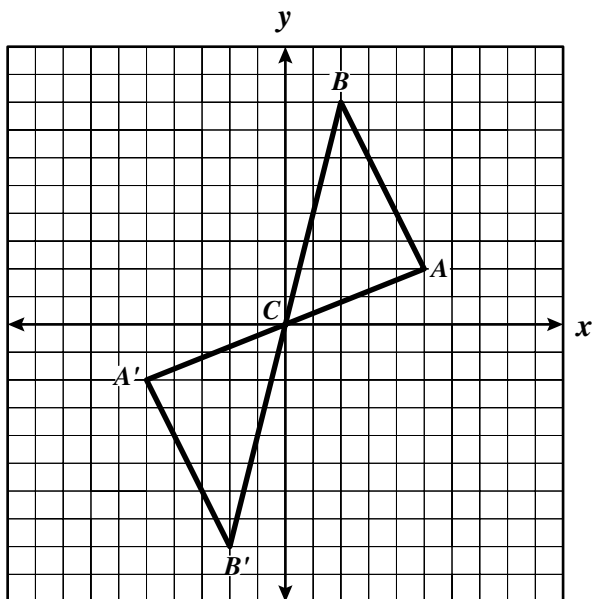
Quadrilateral  $ABCD$  is symmetric with respect to the  $y$  axis. If the coordinates of  $B$  are  $(2, 1)$ , what are the coordinates of  $D$ ?

- F  $(-2, -1)$
- G  $(-1, -2)$
- H  $(-2, 1)$
- J  $(-1, 2)$

- 41 If  $\overrightarrow{RS} = (3, -2)$  and  $\overrightarrow{TV} = (-1, -4)$ , which column matrix shows the resultant  $\overrightarrow{RS} + \overrightarrow{TV}$ ?

- A  $\begin{bmatrix} 2 \\ -6 \end{bmatrix}$
- B  $\begin{bmatrix} 4 \\ 2 \end{bmatrix}$
- C  $\begin{bmatrix} -4 \\ -2 \end{bmatrix}$
- D  $\begin{bmatrix} -6 \\ 2 \end{bmatrix}$





Triangle  $A'B'C$  is —

- F** a translation of triangle  $ABC$  across the  $y$ -axis
- G** a  $180^\circ$  rotation of triangle  $ABC$  about the origin
- H** a reflection of triangle  $ABC$  across the  $y$ -axis only
- J** a reflection of triangle  $ABC$  across the  $x$ -axis only
- 43** A circle whose center is at  $(1, -3)$  passes through  $(7, 5)$ . What is the length of the radius of the circle?
- A** 10
- B**  $\sqrt{40}$
- C**  $\sqrt{68}$
- D** 14

- 44**  $\overrightarrow{AB} = (4, -3)$   
 $\overrightarrow{BC} = (2, 4)$   
 $\overrightarrow{CD} = (-1, 1)$

Which matrix gives the resultant  $\overrightarrow{AD}$  of the vector sum  $\overrightarrow{AB} + \overrightarrow{BC} + \overrightarrow{CD}$ ?

- F**  $\begin{bmatrix} 5 \\ 2 \end{bmatrix}$
- G**  $\begin{bmatrix} 3 \\ -2 \end{bmatrix}$
- H**  $\begin{bmatrix} 5 \\ 8 \end{bmatrix}$
- J**  $\begin{bmatrix} -5 \\ 4 \end{bmatrix}$

- 45** Joan drives 3 miles north, turns east for 2 miles, then north again for 4 miles, and finally 5 miles east. Which vector could be used to describe the resultant of her drive?
- A**  $(5, 9)$
- B**  $(5, 10)$
- C**  $(7, 7)$
- D**  $(7, 10)$