

VIRGINIA STANDARDS OF LEARNING

Spring 2010 Released Test

# END OF COURSE GEOMETRY

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Form M0110, CORE 1

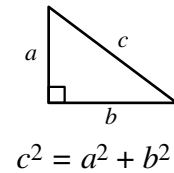
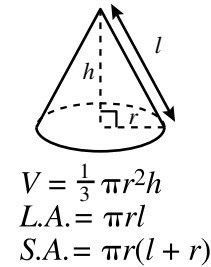
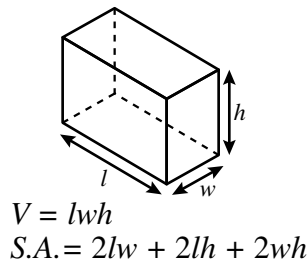
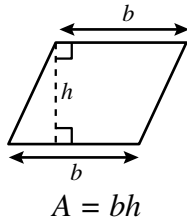
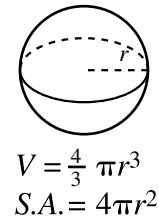
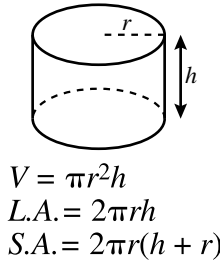
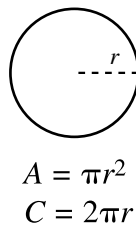
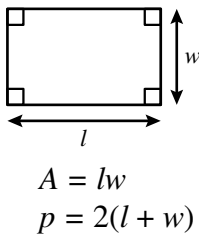
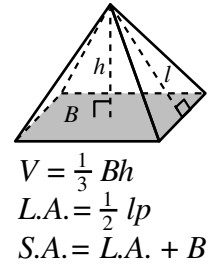
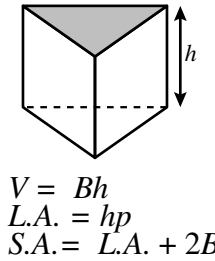
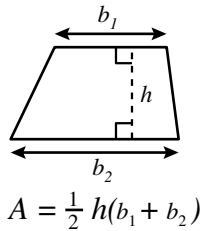
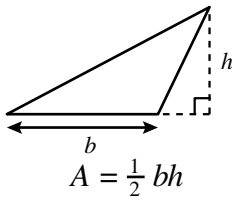
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# Geometry Formula Sheet

## Geometric Formulas



## Geometric Symbols

| Example                    | Meaning                      | Example   | Meaning                                   |
|----------------------------|------------------------------|---|---|
| $\angle A$                 | angle $A$                    | $\overrightarrow{AB}$                                       | vector $AB$                               |
| $m\angle A$                | measure of angle $A$         | $\perp$   | right angle                               |
| $\overline{AB}$            | line segment $AB$            | $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ | Line $AB$ is parallel to line $CD$ .      |
| $AB$                       | measure of line segment $AB$ | $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$     | Line $AB$ is perpendicular to line $CD$ . |
| $\overleftrightarrow{AB}$  | line $AB$                    | $\angle A \cong \angle B$                                   | Angle $A$ is congruent to angle $B$ .     |
| $\triangle ABC$            | triangle $ABC$               | $\triangle A \sim \triangle B$                              | Triangle $A$ is similar to triangle $B$ . |
| $\square ABCD$             | rectangle $ABCD$             |   | Similarly marked segments are congruent.  |
| $\parallel\! \! \! / ABCD$ | parallelogram $ABCD$         |   | Similarly marked angles are congruent.    |

## Abbreviations

|                    |        |
|--------------------|--------|
| Volume             | $V$    |
| Lateral Area       | $L.A.$ |
| Total Surface Area | $S.A.$ |
| Area of Base       | $B$    |

## Pi

$$\pi \approx 3.14$$

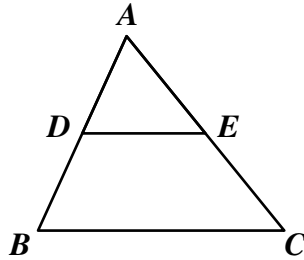
$$\pi \approx \frac{22}{7}$$



**Directions**

Read each question and choose the best answer.

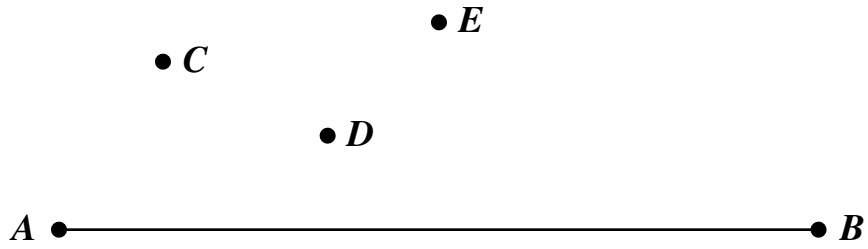
**SAMPLE**



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

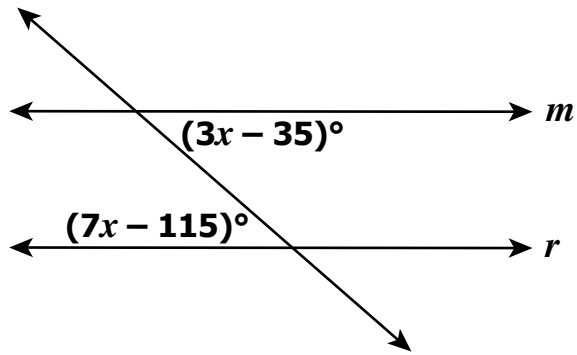
- A**  $AC$
- B**  $AE$
- C**  $DE$
- D**  $BC$

1 A bisector of  $\overline{AB}$  contains which line segment?



- A  $\overline{CG}$
- B  $\overline{DF}$
- C  $\overline{DG}$
- D  $\overline{EF}$

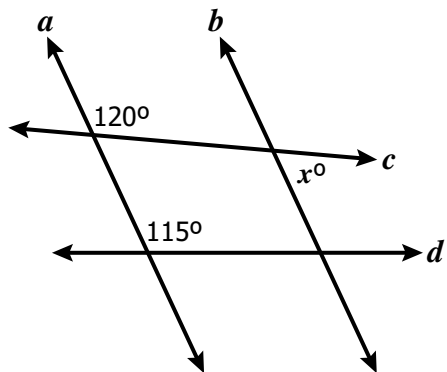
2 Lines  $m$  and  $r$  are cut by a transversal.



What value of  $x$  will show that line  $m$  is parallel to line  $r$  ?

- F 20
- G 24
- H 25
- J 33

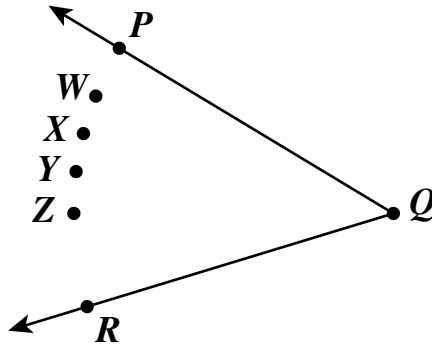
3



If lines  $a$  and  $b$  are parallel, what is the value of  $x$  ?

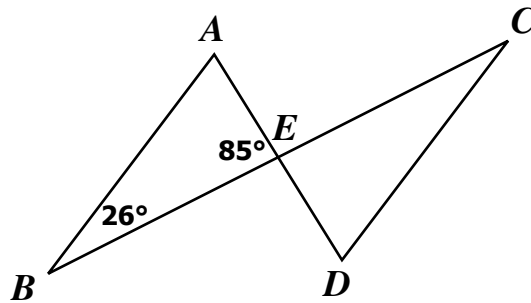
- A 120
- B 115
- C 65
- D 60

4 Which point lies on the bisector of angle  $PQR$  ?



- F W
- G X
- H Y
- J Z

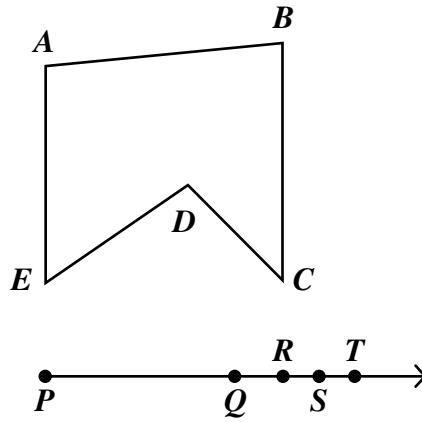
5 For what measure of  $\angle D$  is  $\overline{AB} \parallel \overline{DC}$  in this figure?



- A  $26^\circ$
- B  $59^\circ$
- C  $69^\circ$
- D  $95^\circ$



6



Which line segment is congruent to  $\overline{BC}$  ?

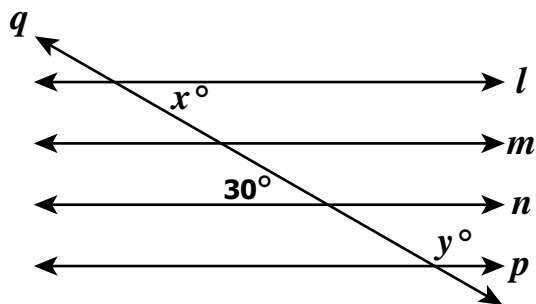
F  $\overline{PQ}$

G  $\overline{PR}$

H  $\overline{PS}$

J  $\overline{PT}$

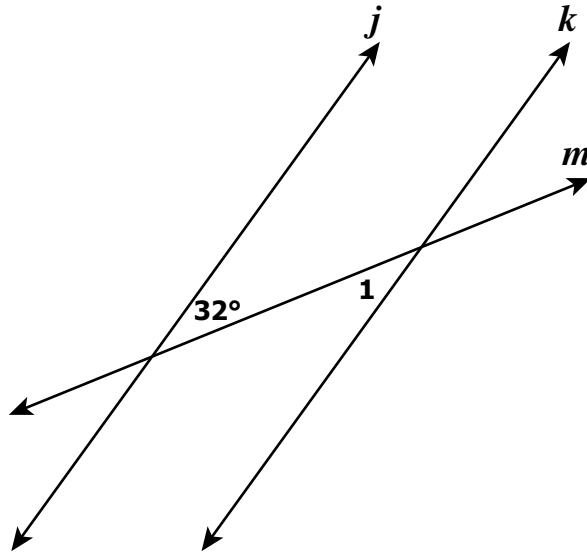
7 In the figure shown, line  $q$  is a transversal of parallel lines  $l$ ,  $m$ ,  $n$ , and  $p$ .



What are the values of  $x$  and  $y$  ?

- A  $x = 30, y = 30$
- B  $x = 30, y = 150$
- C  $x = 150, y = 30$
- D  $x = 150, y = 150$

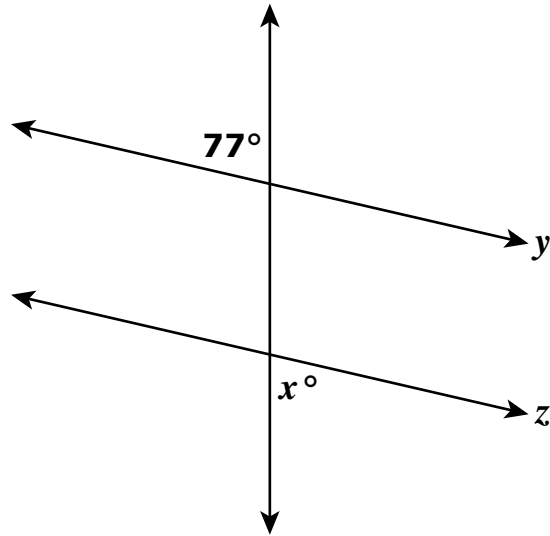
8 In the figure shown, parallel lines  $j$  and  $k$  are cut by transversal  $m$ .



What is  $m\angle 1$  ?

- F  $32^\circ$
- G  $58^\circ$
- H  $122^\circ$
- J  $148^\circ$

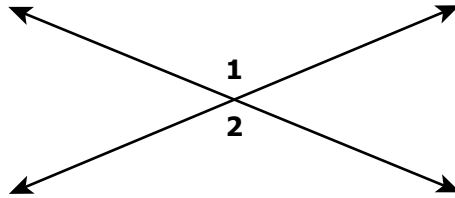
9 Lines  $y$  and  $z$  are cut by a transversal.



For what value of  $x$  is  $y \parallel z$  ?

- A 13
- B 77
- C 103
- D 154

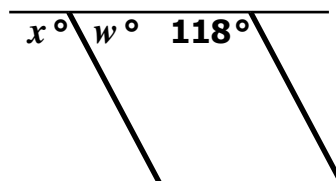
10 In this figure,  $m\angle 1 = (15x - 5)^\circ$  and  $m\angle 2 = (10x + 35)^\circ$ .



What is  $m\angle 1$  ?

- F  $31^\circ$
- G  $65^\circ$
- H  $85^\circ$
- J  $115^\circ$

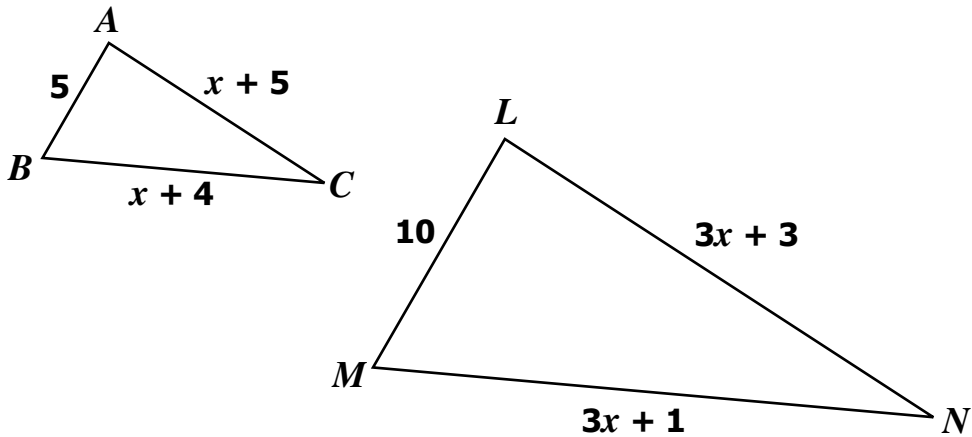
11 This figure represents line segments painted on a parking lot to create parking spaces.



Which equation can be used to show that these line segments are parallel?

- A  $118 - w = x$
- B  $118 - x = w$
- C  $x + 118 = 180$
- D  $w + 118 = 180$

12 Given:  $\triangle ABC \sim \triangle LMN$

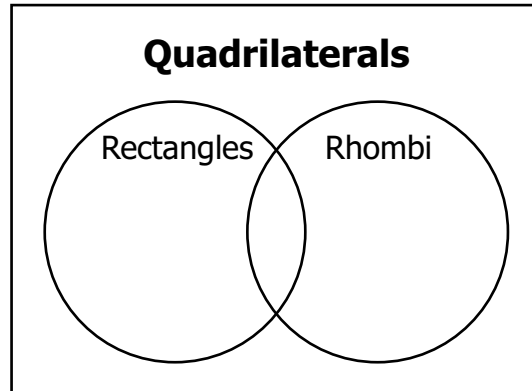


What is the length of  $\overline{AC}$ ?

- F 11
- G 12
- H 22
- J 24

13 Given the following measures of the sides of triangles, which is a right triangle?

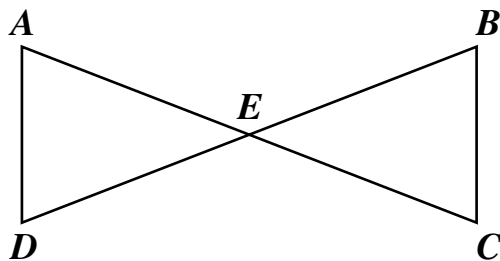
- A 41 cm, 40 cm, 9 cm
- B 45 ft, 40 ft, 35 ft
- C 52 in., 50 in., 11 in.
- D 45 yd, 35 yd, 25 yd



Which of the following statements *must* be true about this Venn diagram?

- F** All rectangles are rhombi.
- G** Some rhombi are rectangles.
- H** Quadrilaterals are not rhombi or rectangles.
- J** All quadrilaterals are rhombi and rectangles.

15 Given: In this figure,  $\overline{AC}$  and  $\overline{BD}$  bisect each other.



Based on the information given, which triangle congruence theorem could be used to prove  $\triangle AED \cong \triangle CEB$ ?

- A Angle-Angle-Side (AAS)
- B Angle-Side-Angle (ASA)
- C Side-Angle-Side (SAS)
- D Side-Side-Side (SSS)

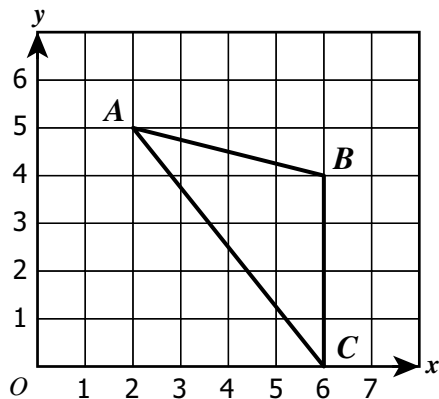
16 Statement: *If lines are skew, then they are not coplanar.*

What is the contrapositive of the statement?

- F If lines are not coplanar, then they are skew.
- G If lines are not skew, then they are coplanar.
- H If lines are coplanar, then they are not skew.
- J If lines are skew, then they are coplanar.



17 Coordinates  $A(2, 5)$ ,  $B(6, 4)$ , and  $C(6, 0)$  are connected to form  $\triangle ABC$ .



If  $\triangle CDA$  is congruent to  $\triangle ABC$ , what are the coordinates of  $D$  ?

- A (1, 1)
- B (1, 2)
- C (2, 2)
- D (2, 1)

18 Let  $p =$  *An equation is of the form  $y = mx + b$ .*

Let  $q =$  *Its graph is a line.*

**Argument:** *If an equation is of the form  $y = mx + b$ , then its graph is a line.  
The graph is not a line.  
Therefore, the equation is not of the form  $y = mx + b$ .*

Which of the following is the symbolic representation of the given argument?

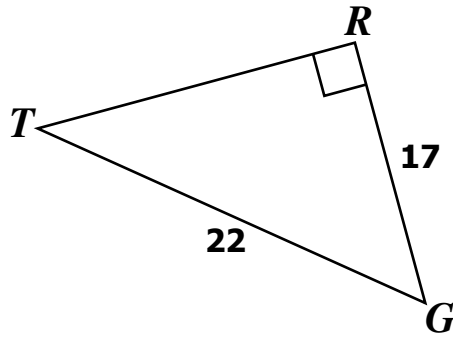
**F** 
$$\begin{array}{l} p \rightarrow q \\ \sim q \\ \therefore \sim p \end{array}$$

**G** 
$$\begin{array}{l} p \rightarrow q \\ q \\ \therefore p \end{array}$$

**H** 
$$\begin{array}{l} p \rightarrow q \\ \sim p \\ \therefore \sim q \end{array}$$

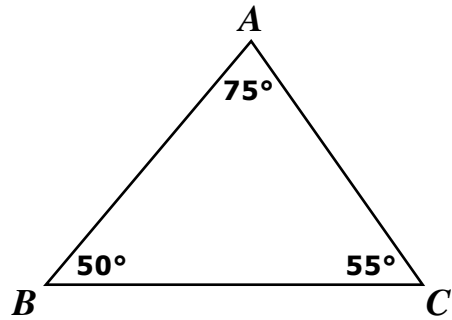
**J** 
$$\begin{array}{l} p \rightarrow q \\ p \\ \therefore q \end{array}$$

19  $\triangle TRG$  is a right triangle.



Which is closest to the length of  $\overline{RT}$  ?

- A 5
- B 11
- C 14
- D 28



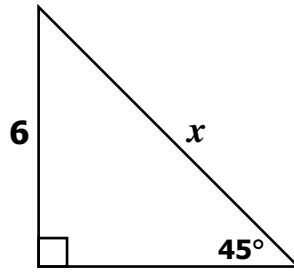
Which list has the sides of  $\triangle ABC$  ordered from longest to shortest?

- F  $\overline{BC}, \overline{AC}, \overline{AB}$
- G  $\overline{AB}, \overline{AC}, \overline{BC}$
- H  $\overline{AC}, \overline{AB}, \overline{BC}$
- J  $\overline{BC}, \overline{AB}, \overline{AC}$

- 21 Three survey markers are located on a map at points  $H, I,$  and  $J$ . A triangle is formed by connecting these markers by string so that  $HI = 150$  feet,  $HJ = 245$  feet, and  $IJ = 365$  feet.

Which statement is true about the measures of the angles of  $\triangle HIJ$ ?

- A  $m\angle H$  is the smallest
- B  $m\angle H$  is the largest
- C  $m\angle I$  is the smallest
- D  $m\angle I$  is the largest

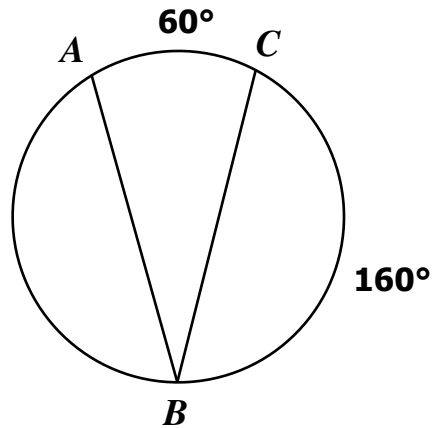


In the figure, what is the value of  $x$ ?

- F 6
- G  $6\sqrt{2}$
- H  $6\sqrt{3}$
- J 12

23 Two sides of a triangle measure 14 inches and 8 inches. Which *cannot* be the length of the remaining side?

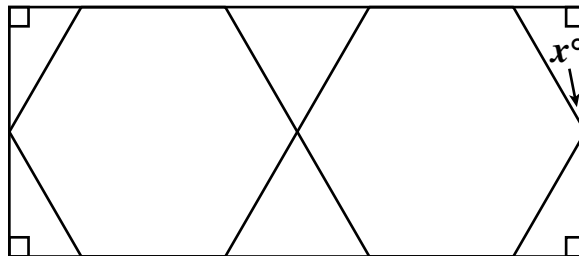
- A 6 in.
- B 8 in.
- C 14 in.
- D 21 in.



In the circle, what is the measure of  $\angle ABC$  ?

- F  $30^\circ$
- G  $60^\circ$
- H  $120^\circ$
- J  $140^\circ$

25 This figure shows a pattern of triangles and regular hexagons.

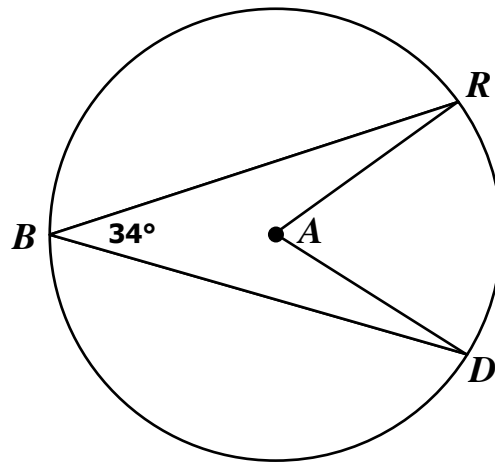


What is the value of  $x$  ?

- A 30
- B 60
- C 90
- D 120

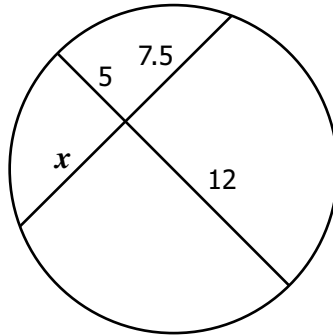
- 26 Which figure has all sides of equal measure but not necessarily all angles of equal measure?
- F Square
  - G Rectangle
  - H Rhombus
  - J Trapezoid

27 What is  $m\angle DAR$  in circle  $A$  ?



- A  $17^\circ$
- B  $34^\circ$
- C  $56^\circ$
- D  $68^\circ$

28 Two chords intersect with the measures shown in the drawing.



What is the value of  $x$  ?

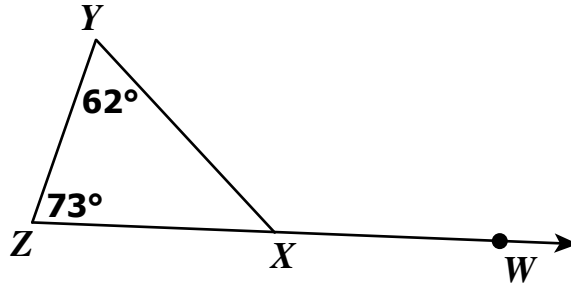
- F 8.0
- G 9.5
- H 10.0
- J 14.5

29 In rectangle  $ABCD$ , the slope of  $\overline{AB}$  is  $\frac{1}{2}$ . What is the slope of  $\overline{CD}$  ?

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

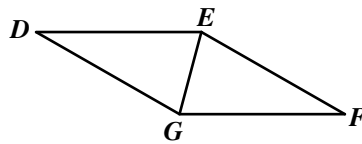


30 In the figure shown, what is  $m\angle WXY$  ?



- F  $45^\circ$
- G  $107^\circ$
- H  $120^\circ$
- J  $135^\circ$

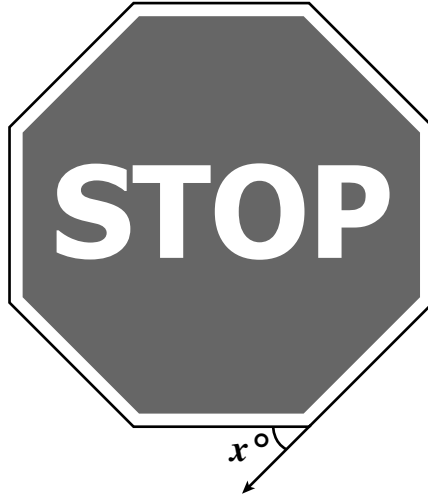
31  $DEFG$  is a rhombus with  $m\angle EFG = 28^\circ$ .



What is  $m\angle GDE$  ?

- A  $14^\circ$
- B  $28^\circ$
- C  $30^\circ$
- D  $56^\circ$

32 This figure is a traffic sign in the shape of a regular octagon.



What is the value of  $x$  ?

- F 45
- G 60
- H 135
- J 180

33 A rectangular rug is 24 feet long and 10 feet wide. A rhombus design is formed inside the rug by joining the midpoints of each side of the rectangle. What is the length of each side of the rhombus?

- A 13 ft
- B 26 ft
- C 169 ft
- D 240 ft

**34** A man who is 6 feet tall casts a shadow that is 4 feet long. At the same time, a nearby flagpole casts a shadow that is 18 feet long. How tall is the flagpole?

**F** 10 ft

**G** 12 ft

**H** 22 ft

**J** 27 ft

**35** A fish tank in the shape of a rectangular prism has these dimensions:

- length = 20 inches
- width = 10 inches
- height = 12 inches

What is the volume of water in the tank when it is  $\frac{4}{5}$  full?

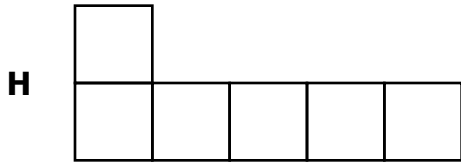
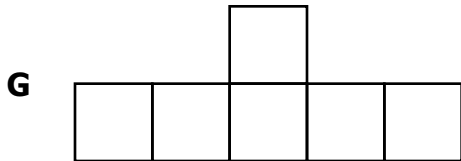
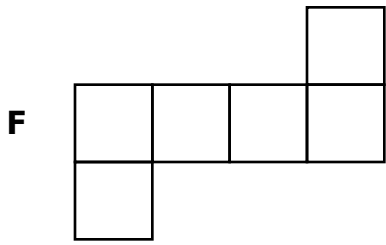
**A** 1,120 cu in.

**B** 1,920 cu in.

**C** 2,400 cu in.

**D** 3,000 cu in.

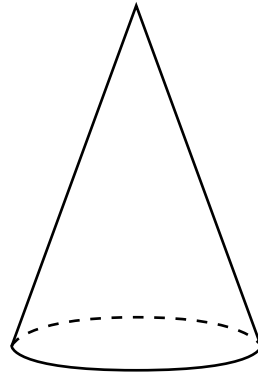
36 Which of these nets would form a cube when folded?



37 If a cube with side length 6 inches has its dimensions divided in half, what will be the volume of the new cube?

- A 108 cubic inches
- B 54 cubic inches
- C 27 cubic inches
- D 9 cubic inches

**38** A right cone is placed on its circular base.



Bottom

**Which statement about the cone is *incorrect*?**

- F** The view from the front is a triangle.
- G** The view from the bottom is a circle.
- H** The view from the top is a circle.
- J** The view from the left is a rhombus.

**39** A cone has a slant height of 10 centimeters and a lateral area of  $60\pi$  square centimeters. What is the volume of a sphere with a radius equal to that of the cone?

- A**  $102\pi$  cm<sup>3</sup>
- B**  $144\pi$  cm<sup>3</sup>
- C**  $288\pi$  cm<sup>3</sup>
- D**  $1,333\pi$  cm<sup>3</sup>

**40** Which line of reflection maps point  $K$  at  $(-2, 2)$  to point  $K'$  at  $(2, -2)$  ?

**F**  $y = 2$

**G**  $y = x$

**H**  $x$ -axis

**J**  $y$ -axis

**41** If the coordinates of  $A$  are  $(1, 1)$  and the midpoint of  $\overline{AB}$  is  $(-2, 0)$ , then the coordinates of  $B$  are —

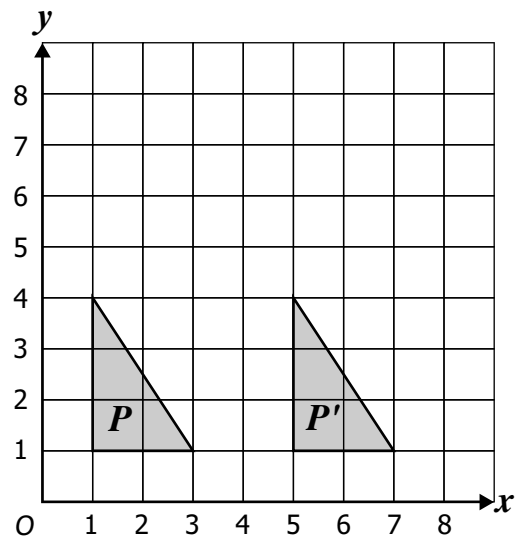
**A**  $(-0.5, 0.5)$

**B**  $(0.5, 0.5)$

**C**  $(-1, 0)$

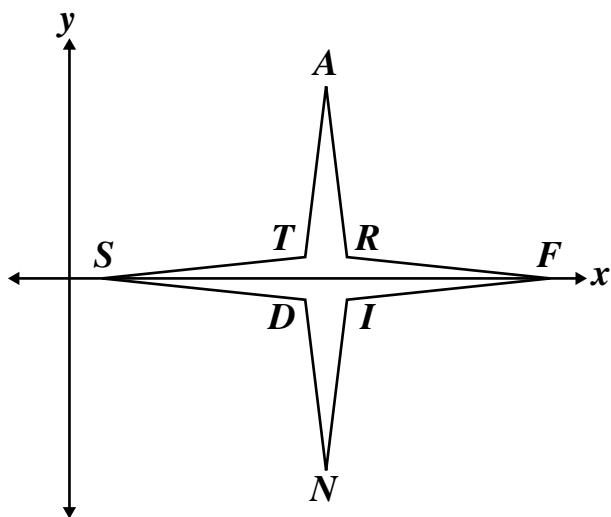
**D**  $(-5, -1)$

- 42 Which transformation could move the triangle  $P$  to triangle  $P'$  in a single step?



- F** Reflection over  $x = 4$
- G** Rotation about  $(2, 3)$
- H** Reflection over  $y = 4$
- J** Translation

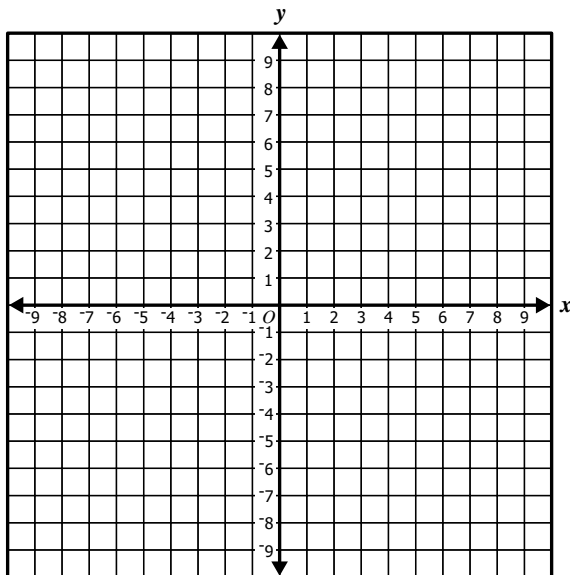
- 43 Figure *STARFIND* is symmetric with respect to the  $x$ -axis. The coordinates of point  $A$  are  $(8, 6)$ . What are the coordinates of point  $N$ ?



- A  $(8, -6)$
- B  $(6, -8)$
- C  $(-6, 8)$
- D  $(-8, 6)$



- 44 Parallelogram  $RSTV$  has coordinates  $R(0, 0)$ ,  $S(2, 4)$ ,  $T(6, 0)$ , and  $V(4, -4)$ . Which ordered pair represents the intersection of the diagonals of this parallelogram? (The coordinate grid may be used to help answer this question.)



- F  $(2, 0)$
- G  $(3, 0)$
- H  $(3, 1)$
- J  $(4, -1)$

**45 A regular quadrilateral has what type of symmetry?**

- A** Line symmetry only
- B** Point symmetry only
- C** Both point and line symmetry
- D** Neither point nor line symmetry



**Answer Key-EOC021-M0110**

| <b>Test Sequence Number</b> | <b>Correct Answer</b> | <b>Reporting Category</b> | <b>Reporting Category Description</b>    |
|-----------------------------|-----------------------|---------------------------|--|
| 1                           | D                     | 001                       | Lines and Angles                         |
| 2                           | F                     | 001                       | Lines and Angles                         |
| 3                           | D                     | 001                       | Lines and Angles                         |
| 4                           | H                     | 001                       | Lines and Angles                         |
| 5                           | C                     | 001                       | Lines and Angles                         |
| 6                           | G                     | 001                       | Lines and Angles                         |
| 7                           | B                     | 001                       | Lines and Angles                         |
| 8                           | F                     | 001                       | Lines and Angles                         |
| 9                           | B                     | 001                       | Lines and Angles                         |
| 10                          | J                     | 001                       | Lines and Angles                         |
| 11                          | D                     | 001                       | Lines and Angles                         |
| 12                          | G                     | 002                       | Triangles and Logic                      |
| 13                          | A                     | 002                       | Triangles and Logic                      |
| 14                          | G                     | 002                       | Triangles and Logic                      |
| 15                          | C                     | 002                       | Triangles and Logic                      |
| 16                          | H                     | 002                       | Triangles and Logic                      |
| 17                          | D                     | 002                       | Triangles and Logic                      |
| 18                          | F                     | 002                       | Triangles and Logic                      |
| 19                          | C                     | 002                       | Triangles and Logic                      |
| 20                          | J                     | 002                       | Triangles and Logic                      |
| 21                          | B                     | 002                       | Triangles and Logic                      |
| 22                          | G                     | 002                       | Triangles and Logic                      |
| 23                          | A                     | 002                       | Triangles and Logic                      |
| 24                          | F                     | 003                       | Polygons and Circles                     |
| 25                          | A                     | 003                       | Polygons and Circles                     |
| 26                          | H                     | 003                       | Polygons and Circles                     |
| 27                          | D                     | 003                       | Polygons and Circles                     |
| 28                          | F                     | 003                       | Polygons and Circles                     |
| 29                          | C                     | 003                       | Polygons and Circles                     |
| 30                          | J                     | 003                       | Polygons and Circles                     |
| 31                          | B                     | 003                       | Polygons and Circles                     |
| 32                          | F                     | 003                       | Polygons and Circles                     |
| 33                          | A                     | 003                       | Polygons and Circles                     |
| 34                          | J                     | 004                       | Three-Dimensional Figures                |
| 35                          | B                     | 004                       | Three-Dimensional Figures                |
| 36                          | F                     | 004                       | Three-Dimensional Figures                |
| 37                          | C                     | 004                       | Three-Dimensional Figures                |
| 38                          | J                     | 004                       | Three-Dimensional Figures                |
| 39                          | C                     | 004                       | Three-Dimensional Figures                |
| 40                          | G                     | 005                       | Coordinate Relations and Transformations |
| 41                          | D                     | 005                       | Coordinate Relations and Transformations |
| 42                          | J                     | 005                       | Coordinate Relations and Transformations |
| 43                          | A                     | 005                       | Coordinate Relations and Transformations |
| 44                          | G                     | 005                       | Coordinate Relations and Transformations |
| 45                          | C                     | 005                       | Coordinate Relations and Transformations |

### Geometry, Core 1

| If you get this<br>many items<br>correct: | Then your<br>converted scale<br>score is: |
|---|---|
| 0   | 000                                       |
| 1   | 177                                       |
| 2   | 213                                       |
| 3   | 234                                       |
| 4   | 250                                       |
| 5   | 263                                       |
| 6   | 274                                       |
| 7   | 284                                       |
| 8   | 292                                       |
| 9   | 300                                       |
| 10  | 307                                       |
| 11  | 314                                       |
| 12  | 320                                       |
| 13  | 326                                       |
| 14  | 332                                       |
| 15  | 338                                       |
| 16  | 343                                       |
| 17  | 348                                       |
| 18  | 353                                       |
| 19  | 358                                       |
| 20  | 363                                       |
| 21  | 368                                       |
| 22  | 373                                       |
| 23  | 378                                       |
| 24  | 383                                       |
| 25  | 388                                       |
| 26  | 392                                       |
| 27  | 397                                       |
| <b>28</b>                                 | <b>402</b>                                |
| 29  | 408                                       |
| 30  | 413                                       |
| 31  | 418                                       |
| 32  | 424                                       |
| 33  | 430                                       |
| 34  | 436                                       |
| 35  | 442                                       |
| 36  | 449                                       |
| 37  | 457                                       |
| 38  | 465                                       |
| 39  | 474                                       |
| 40  | 485                                       |
| 41  | 497                                       |
| <b>42</b>                                 | <b>513</b>                                |
| 43  | 534                                       |
| 44  | 569                                       |
| 45  | 600                                       |

A total raw score (left column) is converted to a total scaled score (right column). The total scaled score may range from 0 to 600.

A scaled score of 400 or more means the student passed the SOL test, while a scaled score of 399 or less means the student did not pass the test. A scaled score of 500 or more indicates the student passed the SOL test at an advanced level.