VIRGINIA STANDARDS OF LEARNING

**Spring 2010 Released Test**

# END OF COURSE GEOMETRY

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Form M0110, CORE 1

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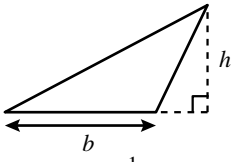
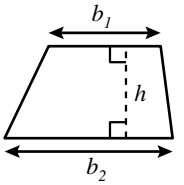
# Geometry Formula Sheet

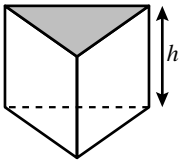
## Geometric Formulas



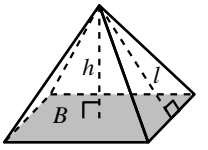

$A = \frac{1}{2}bh$



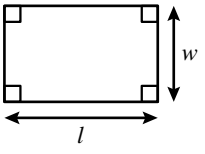

$A = \frac{1}{2}h(b_1 + b_2)$



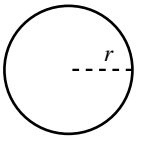

$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$



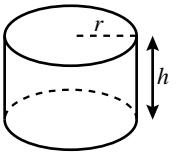

$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



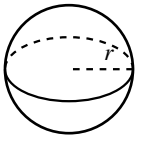

$A = lw$
$p = 2(l + w)$



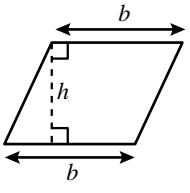

$A = \pi r^2$
$C = 2\pi r$



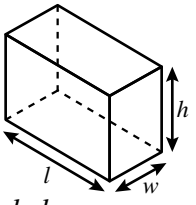

$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$



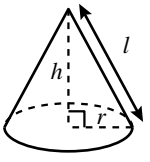

$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$



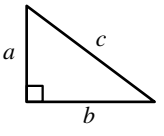

$A = bh$




$V = lwh$
$S.A. = 2lw + 2lh + 2wh$




$V = \frac{1}{3}\pi r^2 h$
$L.A. = \pi rl$
$S.A. = \pi r(l + r)$




$c^2 = a^2 + b^2$

## Geometric Symbols

| Example | Meaning |
|---|---|
| $\angle A$ | angle $A$ |
| $m\angle A$ | measure of angle $A$ |
| $\overline{AB}$ | line segment $AB$ |
| $AB$ | measure of line segment $AB$ |
| $\overleftrightarrow{AB}$ | line $AB$ |
| $\triangle ABC$ | triangle $ABC$ |
| $\square ABCD$ | rectangle $ABCD$ |
| $\square ABCD$ | parallelogram $ABCD$ |

| Example | Meaning |
|---|---|
| $\overrightarrow{AB}$ | vector $AB$ |
| | right angle |
| $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ | Line $AB$ is parallel to line $CD$. |
| $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ | Line $AB$ is perpendicular to line $CD$. |
| $\angle A \cong \angle B$ | Angle $A$ is congruent to angle $B$. |
| $\triangle A \sim \triangle B$ | Triangle $A$ is similar to triangle $B$. |
| | Similarly marked segments are congruent. |
| | Similarly marked angles are congruent. |

## Abbreviations

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

## Pi

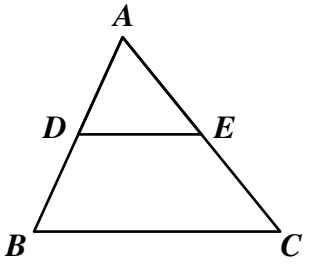
$\pi \approx 3.14$

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

## Directions

Read each question and choose the best answer.

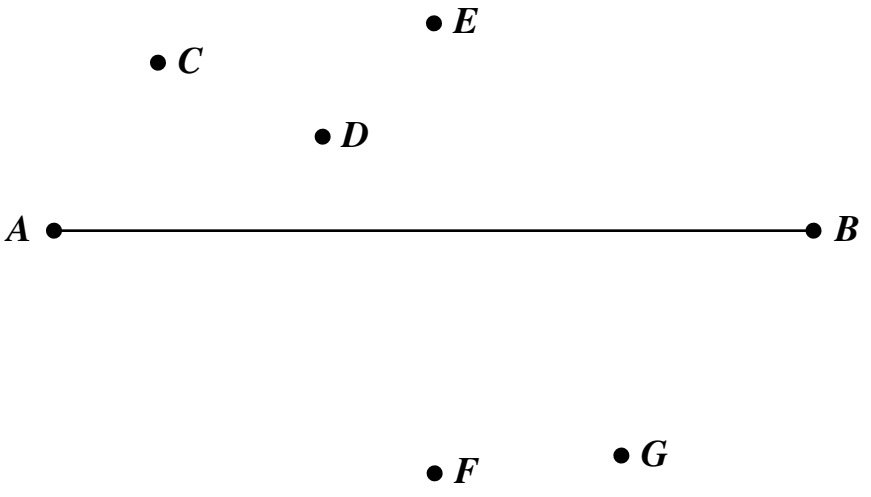
**SAMPLE**




**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?**



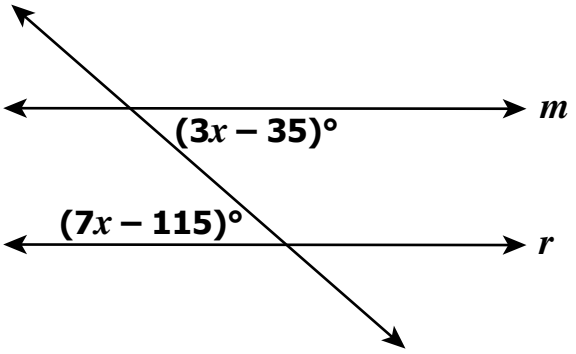

**A** $\overline{CG}$

**B** $\overline{DF}$

**C** $\overline{DG}$

**D** $\overline{EF}$

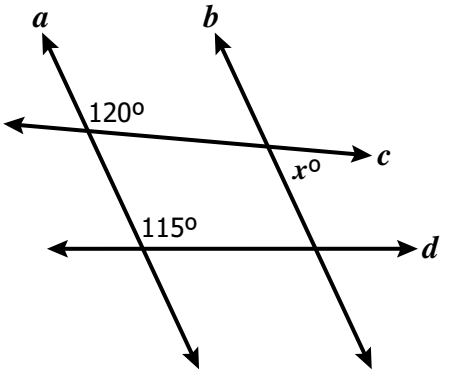
**2 Lines $m$ and $r$ are cut by a transversal.**




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

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

**3**



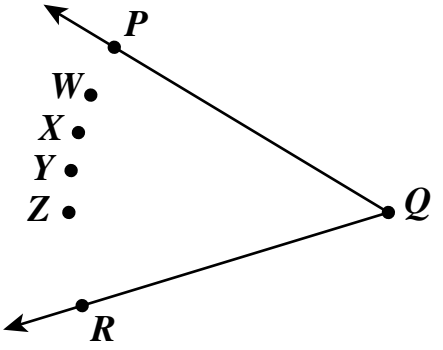

**If lines $a$ and $b$ are parallel, what is the value of $x$ ?**

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



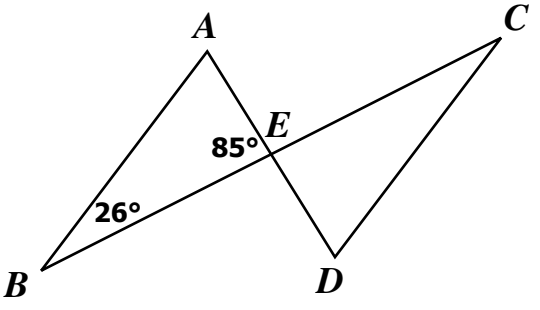
GO ON

**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?**

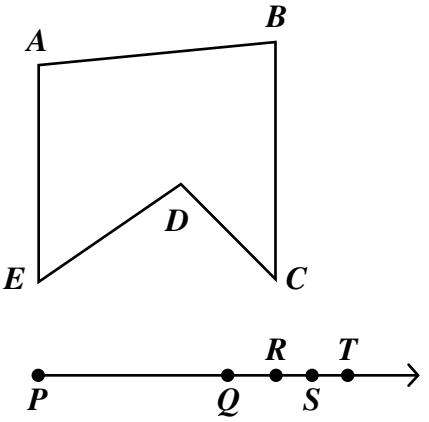



**A** 26°
**B** 59°
**C** 69°
**D** 95°



GO ON

**6**




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

**F** $\overline{PQ}$

**G** $\overline{PR}$

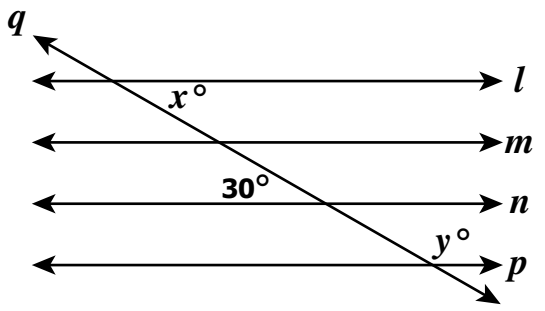
**H** $\overline{PS}$

**J** $\overline{PT}$



GO ON

**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 $y$ ?**

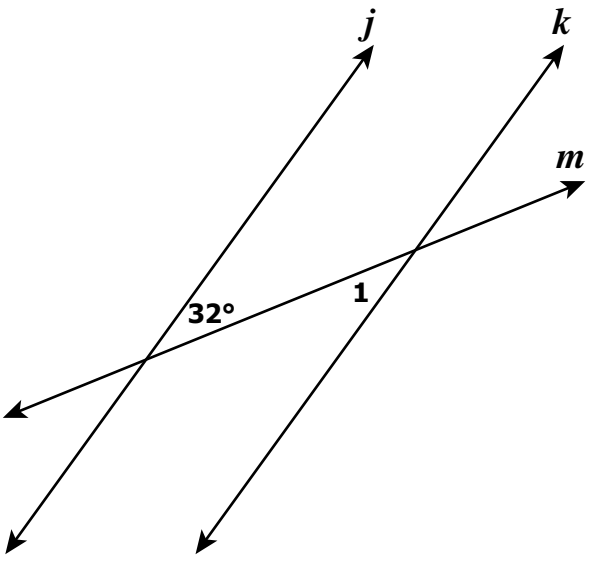
**A** $x = 30,\ y = 30$

**B** $x = 30,\ y = 150$

**C** $x = 150,\ y = 30$

**D** $x = 150,\ y = 150$

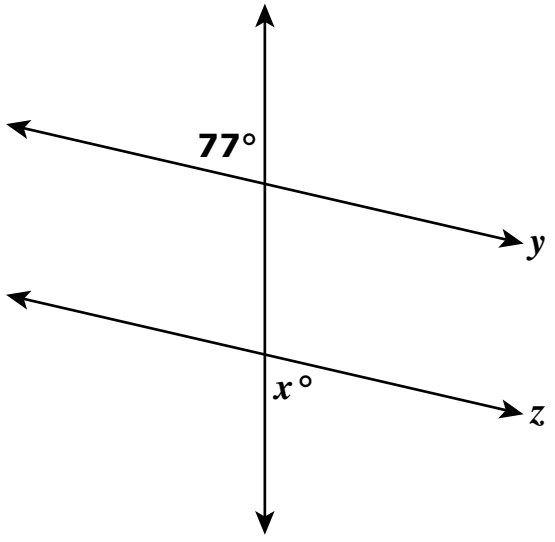
**8 In the figure shown, parallel lines $j$ and $k$ are cut by transversal $m$.**




**What is $m\angle 1$ ?**

**F** 32°
**G** 58°
**H** 122°
**J** 148°

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



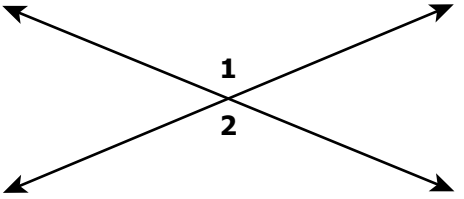

**For what value of $x$ is $y \parallel z$ ?**

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



GO ON

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




**What is $m\angle 1$ ?**

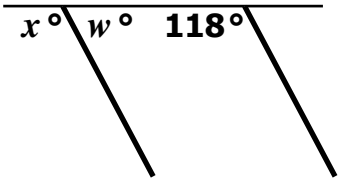
**F** 31°

**G** 65°

**H** 85°

**J** 115°

**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?**

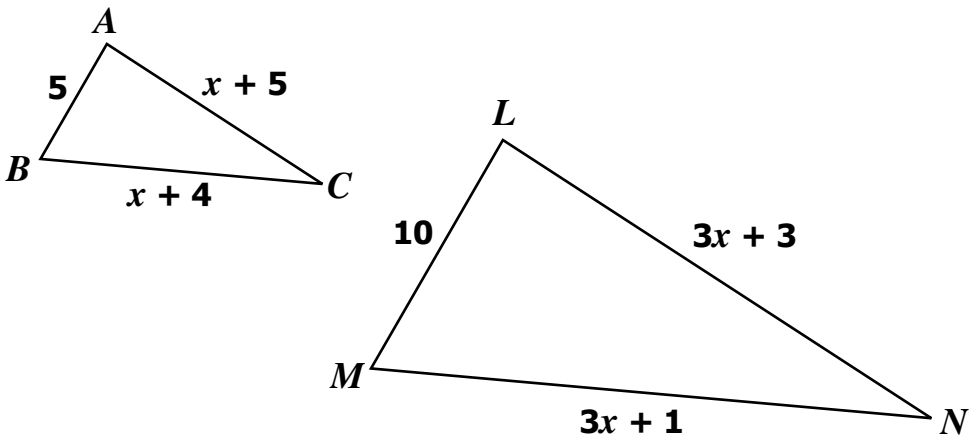
**A** $118 - w = x$

**B** $118 - x = w$

**C** $x + 118 = 180$

**D** $w + 118 = 180$

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



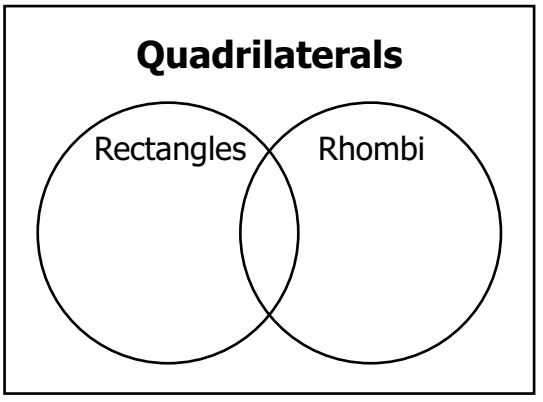

**What is the length of $\overline{AC}$ ?**

**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

**14**




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

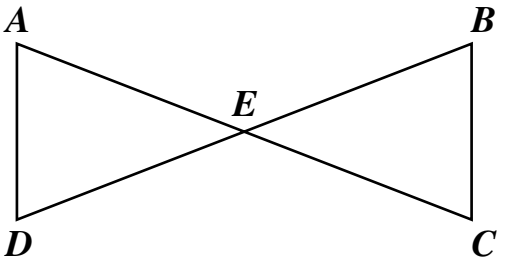
**F** All rectangles are rhombi.

**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 $\triangle AED \cong \triangle CEB$ ?**

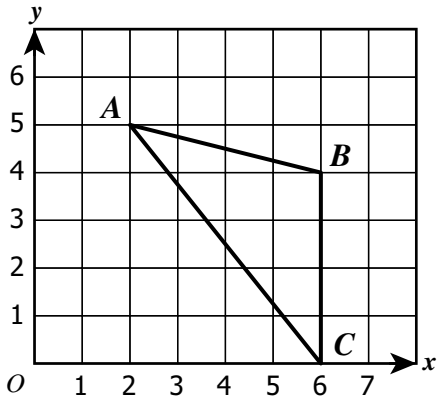
**A** Angle-Angle-Side (AAS)
**B** Angle-Side-Angle (ASA)
**C** Side-Angle-Side (SAS)
**D** Side-Side-Side (SSS)

**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)



GO ON

**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?**

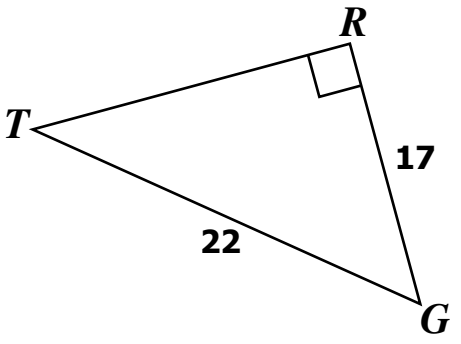
**F**
$$\begin{array}{|l} \hline p \rightarrow q \\ \sim q \\ \therefore \sim p \\ \hline \end{array}$$

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

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

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

**19** $\triangle TRG$ **is a right triangle.**



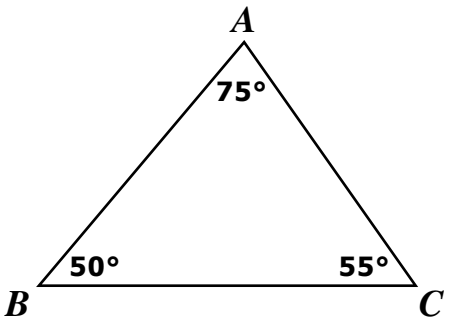

**Which is closest to the length of** $\overline{RT}$ **?**

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



GO ON

**20**




**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 $\triangle HIJ$?**

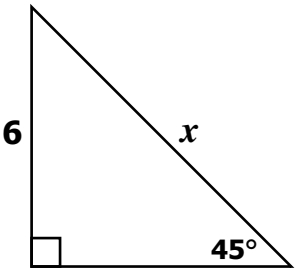
**A** $m\angle H$ is the smallest

**B** $m\angle H$ is the largest

**C** $m\angle I$ is the smallest

**D** $m\angle I$ is the largest

**22**




**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?**

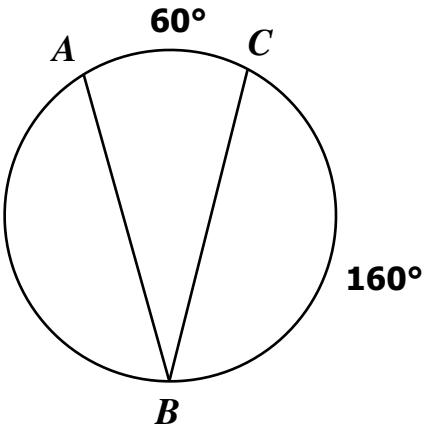
**A** 6 in.

**B** 8 in.

**C** 14 in.

**D** 21 in.

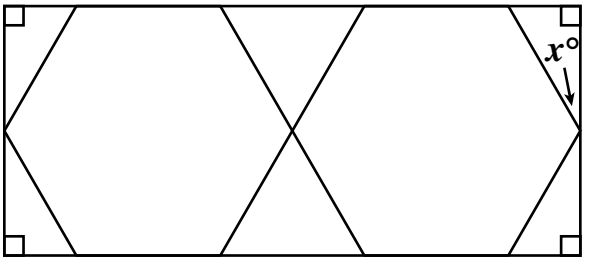
**24**




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

**F** 30°
**G** 60°
**H** 120°
**J** 140°

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



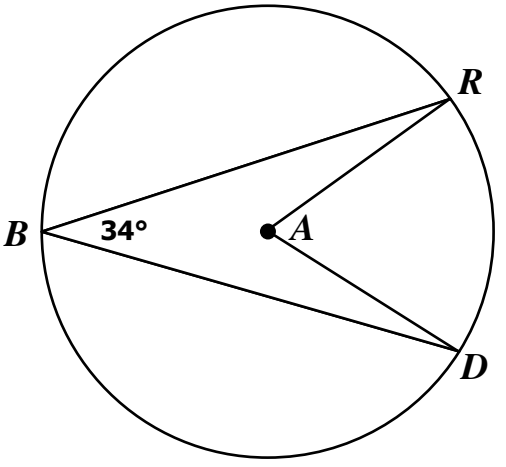

**What is the value of $x$ ?**

**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 $A$ ?**

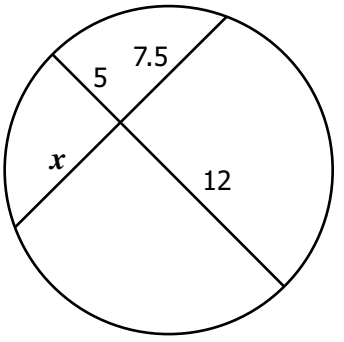



**A** 17°
**B** 34°
**C** 56°
**D** 68°



GO ON

**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** $-\frac{1}{2}$

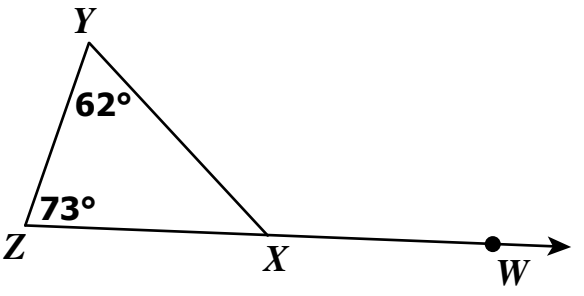
**C** $\frac{1}{2}$

**D** 2



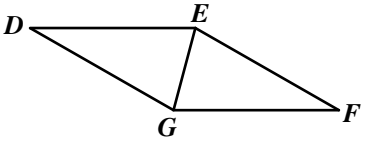
GO ON

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




**F** 45°
**G** 107°
**H** 120°
**J** 135°

**31 $DEFG$ is a rhombus with $m\angle EFG = 28°$.**



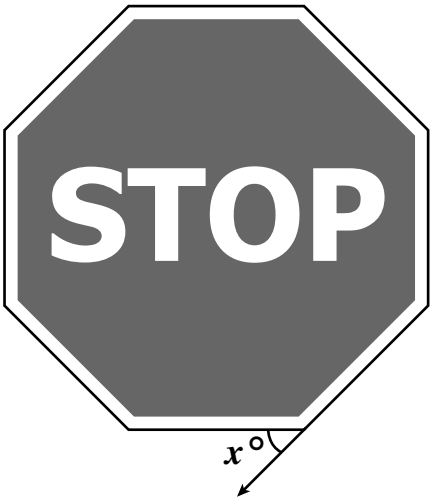

**What is $m\angle GDE$ ?**

**A** 14º
**B** 28º
**C** 30º
**D** 56º



GO ON

**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:**

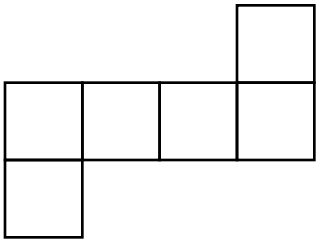
- **length = 20 inches**
- **width = 10 inches**
- **height = 12 inches**

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

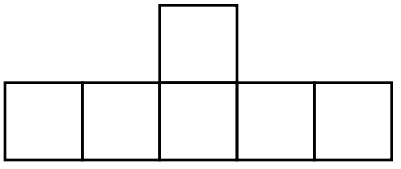
**A** 1,120 cu in.
**B** 1,920 cu in.
**C** 2,400 cu in.
**D** 3,000 cu in.

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

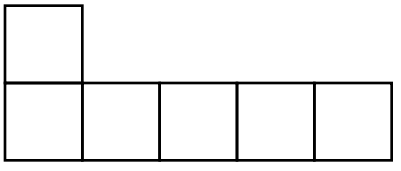
**F**



**G**



**H**



**J**

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

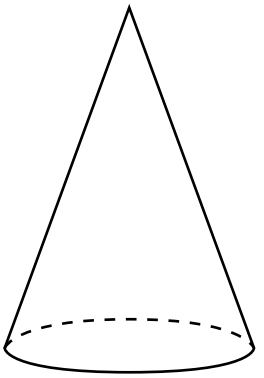
**A** 108 cubic inches

**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** $102\pi$ $cm^3$

**B** $144\pi$ $cm^3$

**C** $288\pi$ $cm^3$

**D** $1{,}333\pi$ $cm^3$

**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 —**

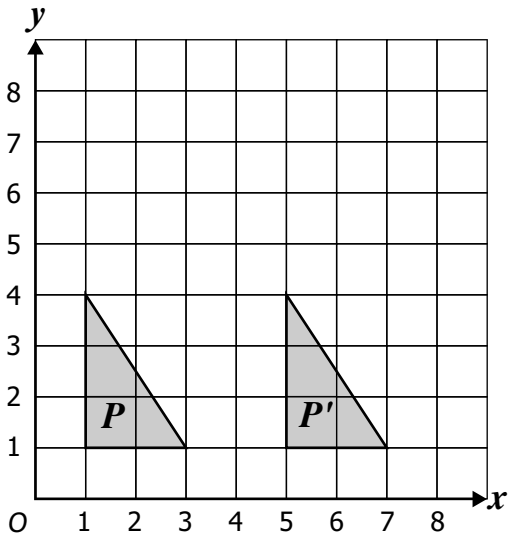
**A** $(^{-}0.5, 0.5)$

**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 $(2, 3)$

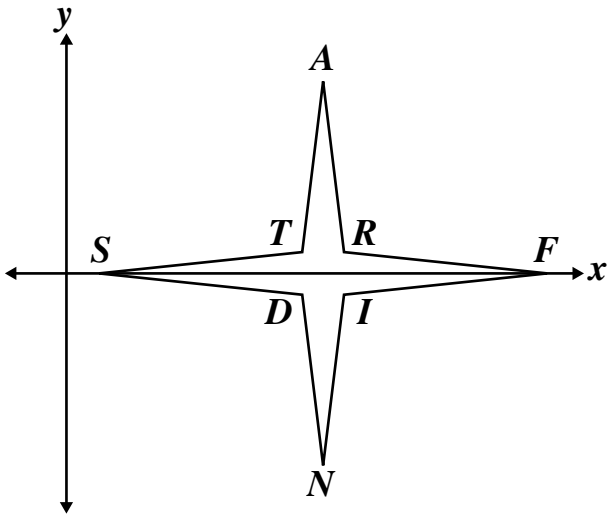
**H** Reflection over $y = 4$

**J** Translation



GO ON

**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 $N$ ?**



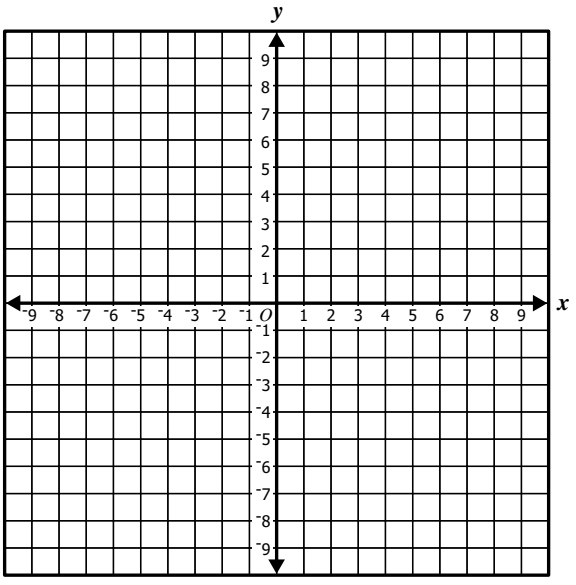

**A** $(8, -6)$

**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



STOP