VIRGINIA STANDARDS OF LEARNING

Spring 2007 Released Test

END OF COURSE GEOMETRY

Form M0117, CORE 1

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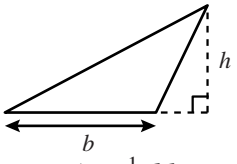
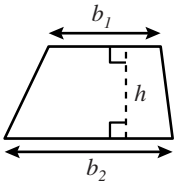
Geometry Formula Sheet

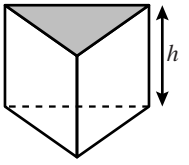
Geometric Formulas



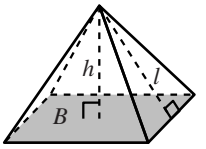
$A = \frac{1}{2}bh$



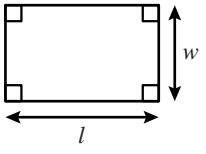
$A = \frac{1}{2}h(b_1 + b_2)$



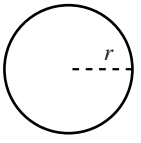
$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$



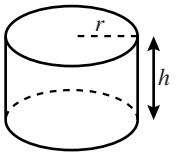
$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



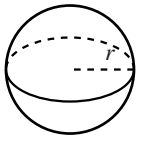
$A = lw$
$p = 2(l + w)$



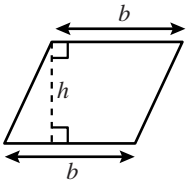
$A = \pi r^2$
$C = 2\pi r$



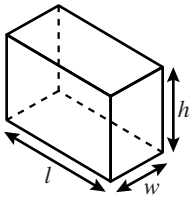
$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$



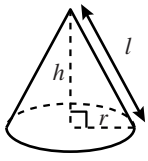
$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$



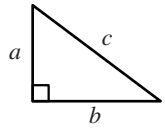
$A = bh$



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



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



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

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

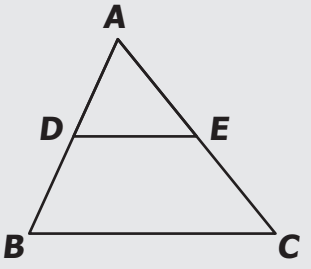
$\pi \approx 3.14$

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

Directions

Read each question carefully and choose the best answer. Then mark the space on your answer document for the answer you have chosen.

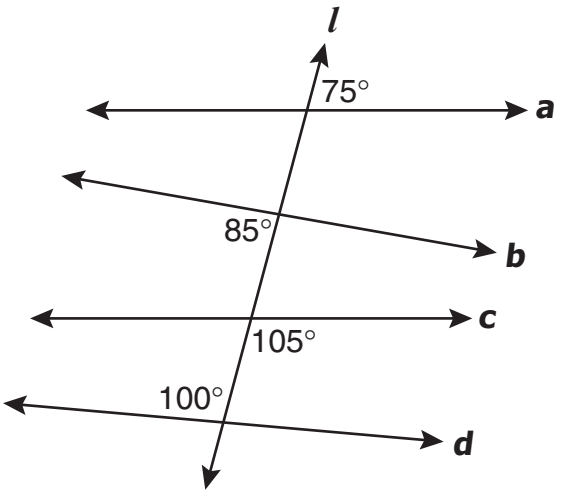
SAMPLE



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*

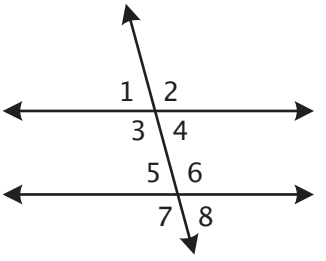
1 Transversal l cuts lines *a*, *b*, *c*, and *d*.



Which two lines are parallel?

A *a* and *c*
B *a* and *d*
C *b* and *c*
D *b* and *d*

2



In the figure above, $\angle 2$ and $\angle 6$ are a pair of —

F consecutive interior angles

G alternate interior angles

H vertical angles

J corresponding angles

3 One exterior angle of a regular polygon measures 72°. What is the measure of one interior angle?

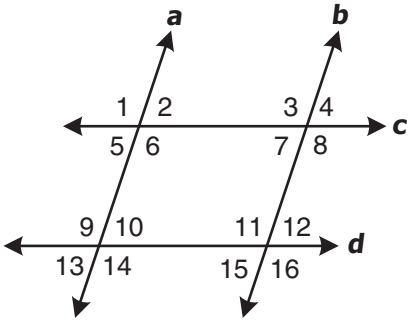
A 18°

B 108°

C 360°

D 540°

4 In this drawing, $a \parallel b$ and $c \parallel d$.



Which angle is *not* necessarily congruent to $\angle 1$?

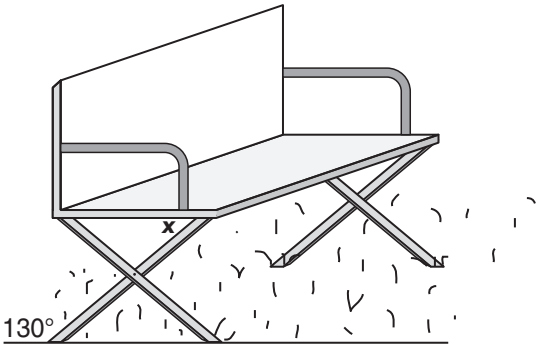
F $\angle 3$

G $\angle 9$

H $\angle 12$

J $\angle 16$

5 The support legs on a bench are attached in such a way that the angle made by one leg with the ground is 130°.



What must the measure of the angle marked *x* be in order for the seat of the bench to be parallel to the ground?

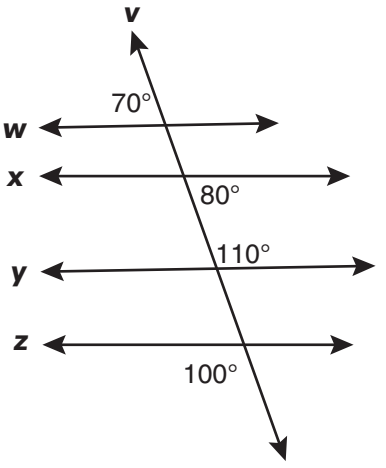
A 50°

B 65°

C 90°

D 130°

6 Line *v* is a transversal.



Which is a true statement?

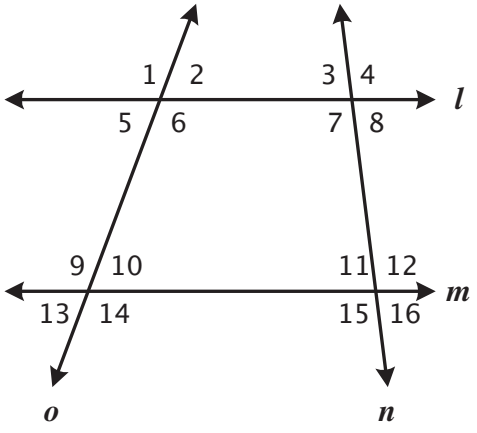
F $w \parallel y$ and $x \parallel z$

G $w \parallel x$ and $y \parallel z$

H $w \parallel z$ and $x \parallel y$

J $w \parallel x$ and $x \parallel y$

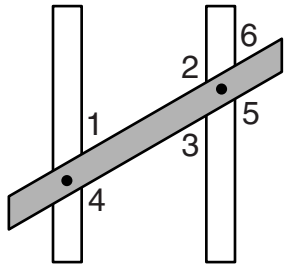
7



In the drawing above, $\angle 4$ and $\angle 12$ are —

A alternate interior angles
B consecutive interior angles
C corresponding angles
D a linear pair

8 A carpenter nailed a board across two beams, forming the angles shown.

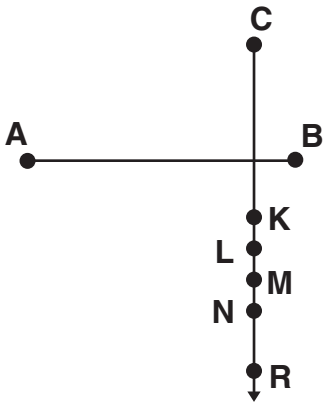


Which equal measures would ensure the beams are parallel?

F $m\angle 1 = m\angle 2$
G $m\angle 1 = m\angle 3$
H $m\angle 2 = m\angle 5$
J $m\angle 3 = m\angle 4$

GO ON

9



Which segment is congruent to $\overline{AB}$?

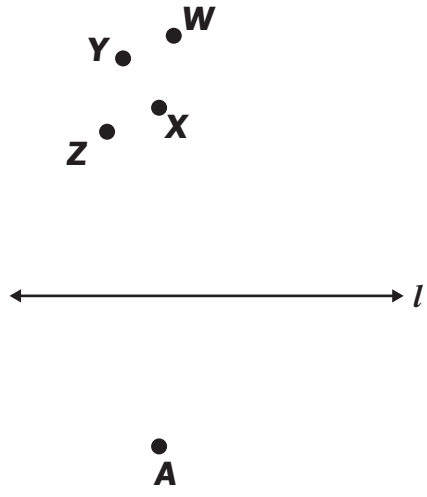
A $\overline{CK}$

B $\overline{CL}$

C $\overline{CM}$

D $\overline{CN}$

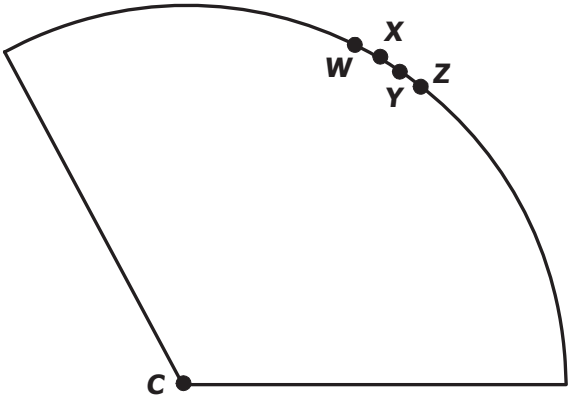
10



Which point apparently lies on the perpendicular to l from A?

F X
G Y
H Z
J W

11 One piece of pie is left for two boys to share.



Where should the pie be cut to ensure each gets an equal piece?

A $\overline{CZ}$

B $\overline{CY}$

C $\overline{CX}$

D $\overline{CW}$

12 If $p \rightarrow q$, and $q \rightarrow r$, then —

F $r \rightarrow p$

G $p \rightarrow r$

H $\sim r \rightarrow p$

J $r \rightarrow \sim p$

13 If the conditional statement

"If you have a laptop, then you have a computer"

is represented by $p \rightarrow q$, what is the symbolic representation of

"If you have a computer, then you do not have a laptop"?

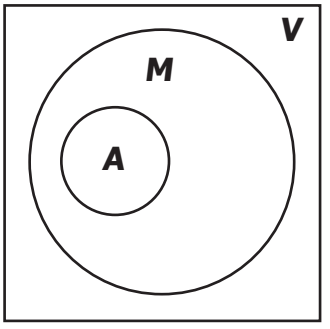
A $q \rightarrow \sim p$

B $\sim q \rightarrow p$

C $p \rightarrow \sim q$

D $\sim q \rightarrow \sim p$

14 In the Venn diagram below, *V* represents the set of all vehicles, *M* represents the set of all motorized vehicles, and *A* represents the set of all automobiles.



Based on the diagram, which is a valid conclusion?

F All automobiles are motorized vehicles.

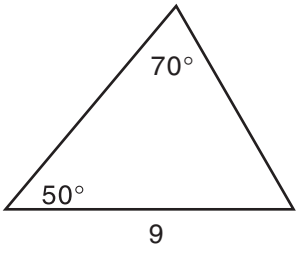
G All motorized vehicles are automobiles.

H Some automobiles are not motorized vehicles.

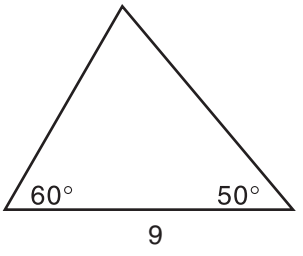
J No automobiles are motorized vehicles.

15 Which triangle below is *not* congruent to the other three triangles?

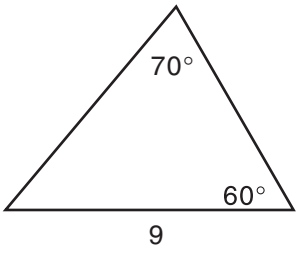
A



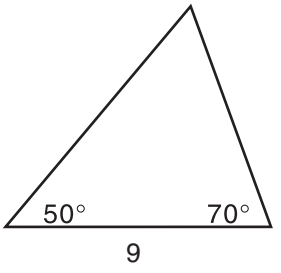
B



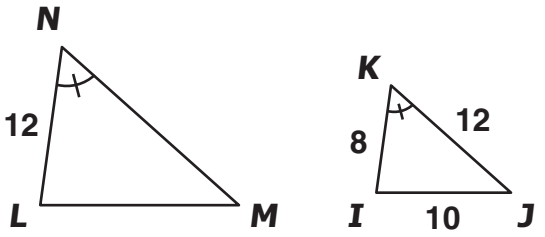
C



D



16



Which additional piece of information would prove that $\triangle IJK \sim \triangle LMN$?

F $NM = 18$

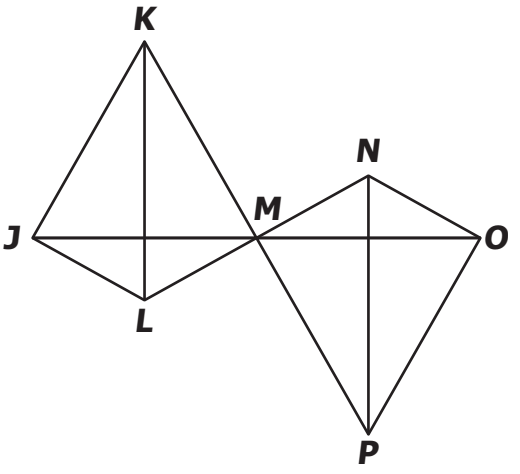
G $LM = 18$

H $NM = 15$

J $LM = 10$

GO ON

17 Given: M is the midpoint of $\overline{LN}$ and $\overline{KP}$.



The given information is sufficient to prove $\triangle KML \cong \triangle PMN$ by which postulate/theorem?

A Angle-Side-Angle
B Side-Side-Side
C Side-Angle-Side
D Angle-Angle-Side

18 Which of the following could *not* be the lengths of the sides of a triangle?

F 6 ft, 3 ft, 9 ft
G 3 cm, 4 cm, 5 cm
H 4 in., 6 in., 8 in.
J 5 km, 2 km, 4 km

19 In $\triangle DEF$, $m\overline{DE} = 8$ inches, $m\overline{EF} = 6$ inches, and $m\overline{DF} = 10$ inches. Which lists the angles in order from *smallest* to *largest*?

A $\angle D, \angle E, \angle F$

B $\angle F, \angle D, \angle E$

C $\angle E, \angle F, \angle D$

D $\angle D, \angle F, \angle E$

20 In $\triangle ABC$, if $m\angle C < m\angle B < m\angle A$, then —

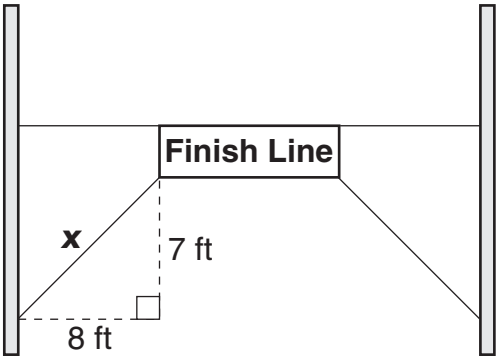
F $AB < AC < BC$

G $AC < AB < BC$

H $AB < BC < CA$

J $BC < AB < CA$

21 To mark the end of a race, a finish-line banner is stretched across the road as shown in the drawing.



Which is closest to the length of the support rope designated by *x* in the drawing?

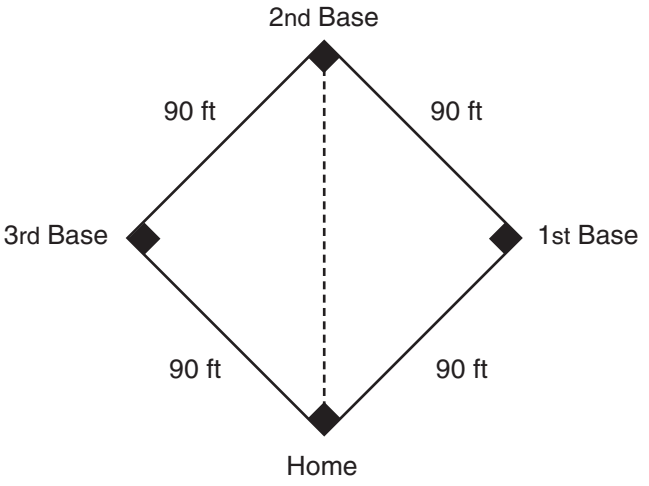
A 9.5 ft

B 10.6 ft

C 12.0 ft

D 15.0 ft

22 A baseball diamond is in the shape of a square, 90 feet on a side.



What is the direct distance from home plate to second base?

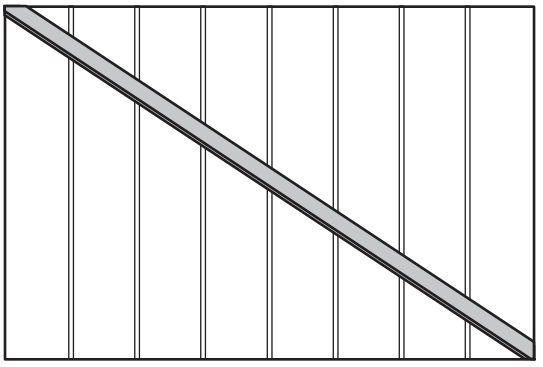
F 90 ft

G $90\sqrt{2}$ ft

H $90\sqrt{3}$ ft

J 180 ft

23



What is the length of a diagonal brace that could be used for a wall 9 feet high and 12 feet long?

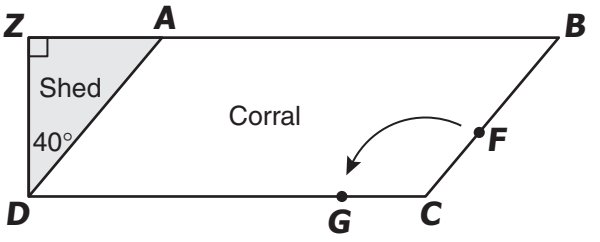
A 12 ft

B 13 ft

C 14 ft

D 15 ft

24 Gene's horse corral, labeled *ABCD* in the drawing, is shaped as a parallelogram and is adjacent to the shed, labeled *ZAD*.



If a gate, labeled *CF*, opens all the way to the corral fence, position labeled *CG*, through how many degrees does the gate swing?

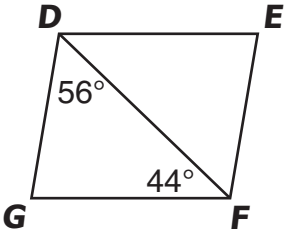
F 40°

G 50°

H 130°

J 140°

25 A diagonal of parallelogram *DEFG* forms angles with measures as shown.



What is the measure of $\angle DEF$?

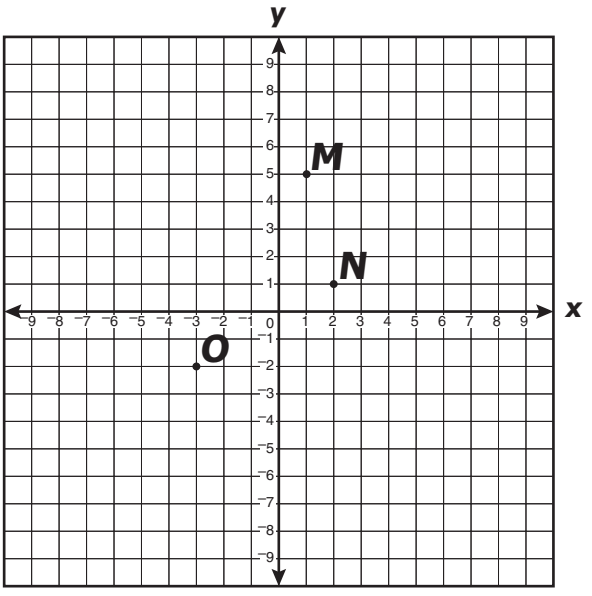
A 44°

B 56°

C 80°

D 100°

26



Quadrilateral *MNOP* is a parallelogram. The coordinates of three of its vertices are $M(1,5)$, $N(2,1)$, and $O(-3,-2)$. If $(x,2)$ are the coordinates of *P*, what is the value of *x*?

F -5

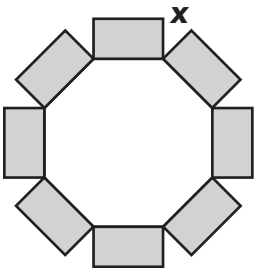
G -4

H -3

J 0

GO ON

27 Rectangular flowerbeds are built on each side of a fishpond in the shape of a regular octagon.



What is the measure of the angle, *x*, between two consecutive flowerbeds?

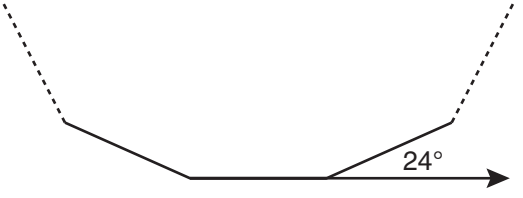
A 30°

B 45°

C 60°

D 90°

28



A portion of a regular polygon is shown. The polygon has —

F 15 sides

G 16 sides

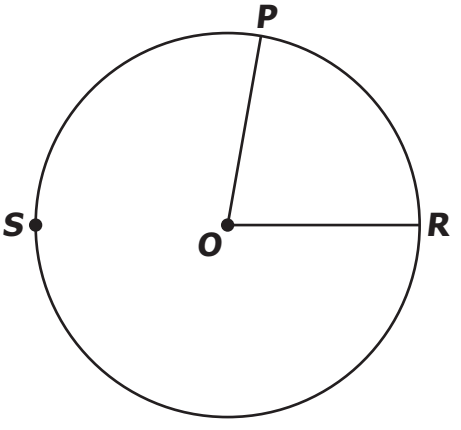
H 18 sides

J 20 sides

29 Each interior angle of a regular polygon has a measure of 162°. The polygon has a total of —

A 17 sides
B 18 sides
C 19 sides
D 20 sides

30 In circle *O*, the degree measure of $\overset{\frown}{PSR}$ is 280°.

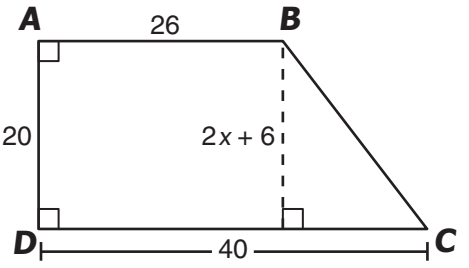


What is the degree measure of $\angle POR$?

F 160°
G 85°
H 80°
J 40°

GO ON

31

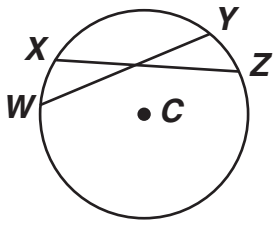


What is the value of *x* in trapezoid *ABCD*?

A 17
B 13
C 10
D 7

GO ON

32 In circle C, $m\overset{\frown}{WX} = 25°$, $m\overset{\frown}{XY} = 40°$, $m\overset{\frown}{YZ} = 25°$, and $WY = 24$ centimeters.



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

F 12 cm

G 24 cm

H 25 cm

J 65 cm

33 **A pizza has a diameter of 16 inches. Which is closest to the area of one slice if the pizza is divided into 6 equal pieces?**

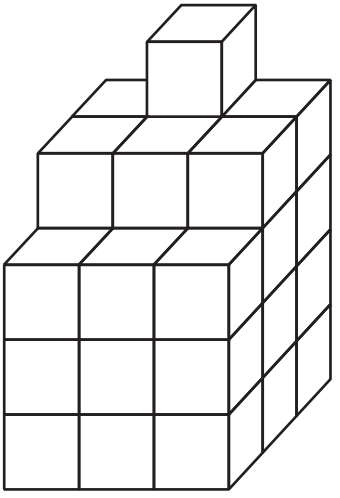
A 134.1 sq in.

B 117.1 sq in.

C 67.2 sq in.

D 33.5 sq in.

34



Assuming the solid is constructed from cubes measuring 1 unit on each edge and that the figure is completely solid, what is the volume of the cubic solid shown above?

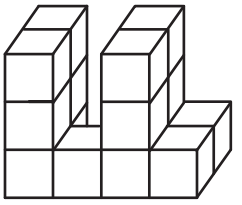
F 12 cubic units

G 34 cubic units

H 59 cubic units

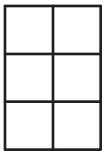
J 68 cubic units

35

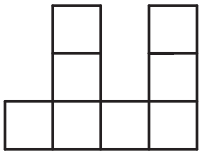


Which could *not* be a two-dimensional view of the block of cubes shown above?

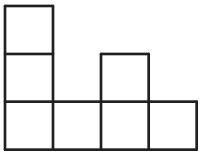
A



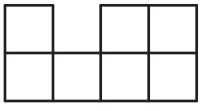
B



C



D



36 Which is closest to the volume of a sphere with a radius equal to 8 centimeters?

F 267.9 cm^3

G 803.8 cm^3

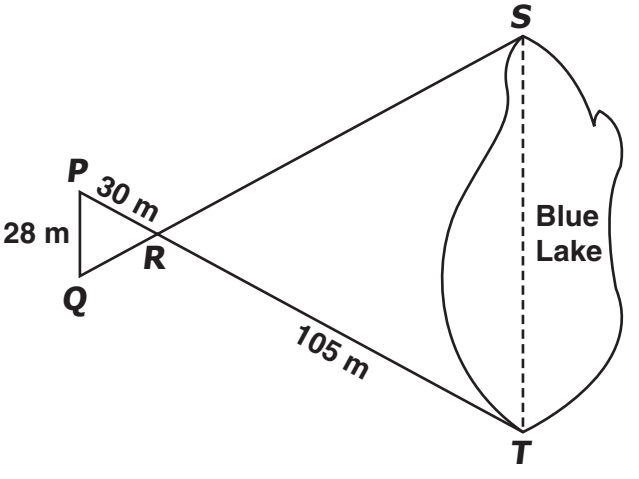
H 1,607.7 cm^3

J 2,143.6 cm^3

37 What is the total surface area of a rectangular prism box that measures 5 feet by 1 foot by 1 foot?

A 5 sq ft
B 20 sq ft
C 22 sq ft
D 30 sq ft

38

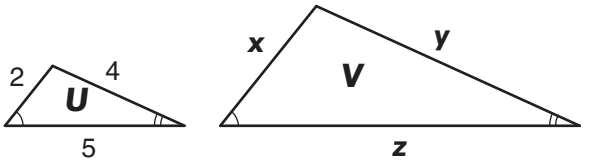


If $\overleftrightarrow{PQ}$ is parallel to $\overleftrightarrow{ST}$, what is *ST*, the width of the lake?

F 62 meters
G 70 meters
H 84 meters
J 98 meters

GO ON

39 **The ratio of the perimeter of $\triangle U$ to the perimeter of $\triangle V$ is 1 : 2.**

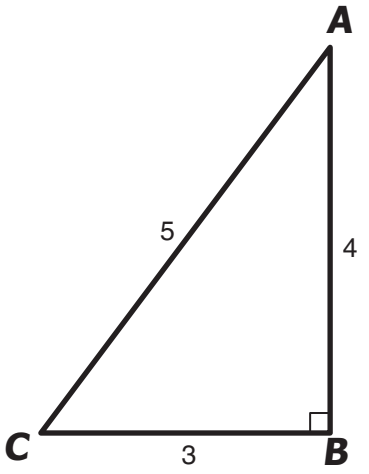


If the triangles are similar, what is the value of $x + y$?

A 3
B 6
C 12
D 18

GO ON

40 Right triangle *ABC* has the measures shown.



What is the *maximum* number of different lines of symmetry that can be drawn through $\triangle ABC$?

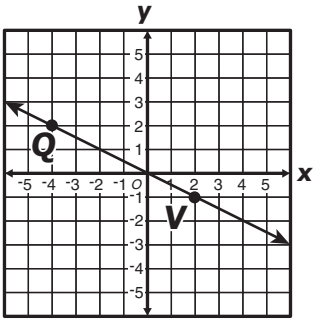
F 0

G 1

H 2

J 3

41



What is the apparent slope of $\overleftrightarrow{QV}$?

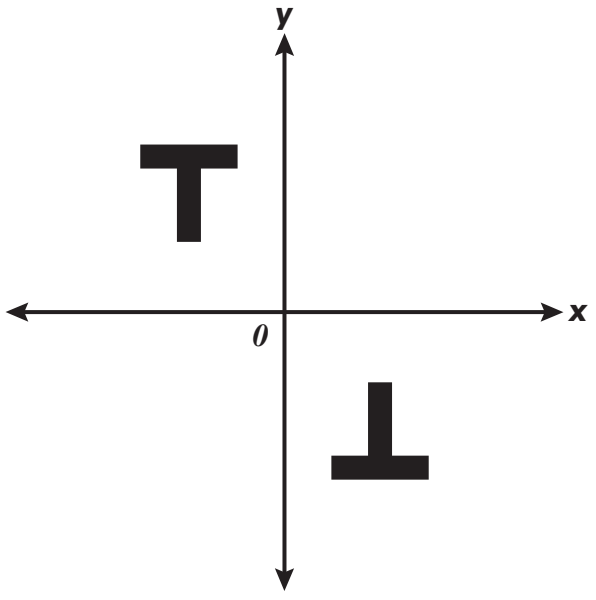
A -2

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

C $\frac{1}{2}$

D 2

42



In relation to one figure, the other figure is apparently a —

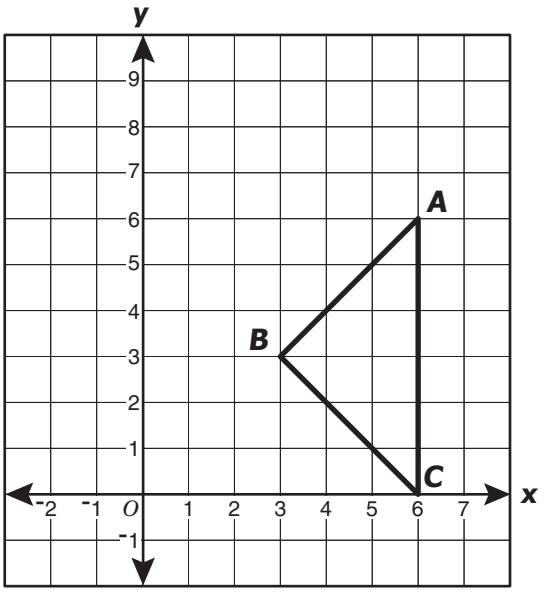
F reflection across the line $y = 1$

G reflection across the line $y = x$

H 90° rotation about the origin

J 180° rotation about the origin

43 Triangle *ABC* is placed on a grid as shown.



The apparent midpoint of $\overline{AB}$ is —

A $(1.5, 1.5)$

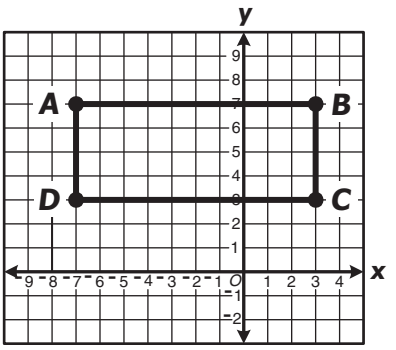
B $(3, 3)$

C $(4.5, 4.5)$

D $(4.5, 1.5)$

GO ON

44 Rectangle *ABCD* is placed in a coordinate plane as shown.



Which equation describes a line of symmetry for rectangle *ABCD*?

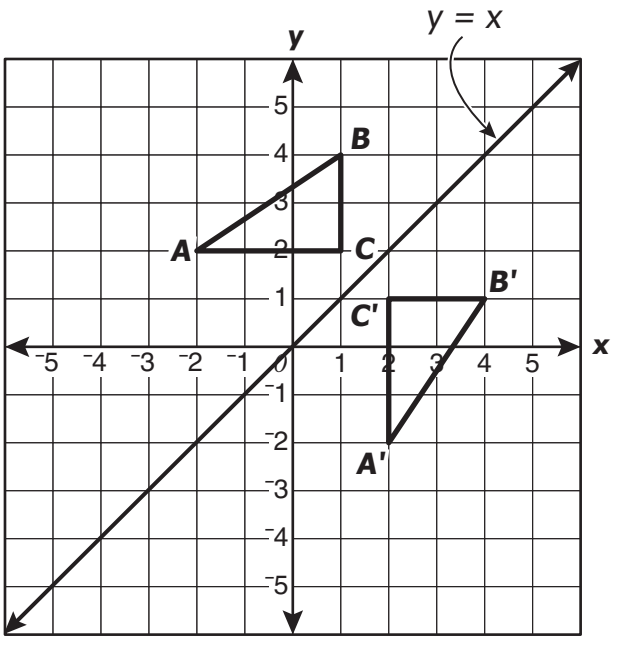
F $x = 2$

G $x = 5$

H $y = 5$

J $y = x$

45



$\triangle A'B'C'$ is apparently the result of —

A reflecting $\triangle ABC$ across the y-axis

B reflecting $\triangle ABC$ across the x-axis

C rotating $\triangle ABC$ about the point (1, 2)

D reflecting $\triangle ABC$ across the line $y = x$

STOP