

VIRGINIA STANDARDS OF LEARNING

Spring 2007 Released Test

# END OF COURSE GEOMETRY

---

Form M0117, CORE 1

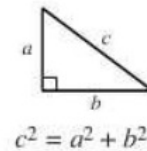
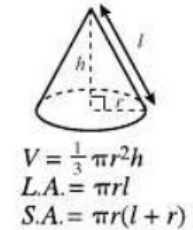
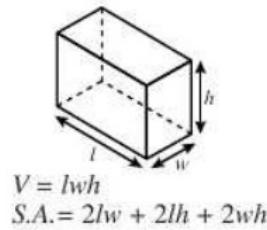
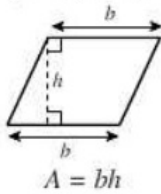
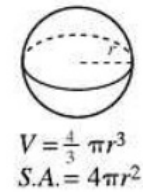
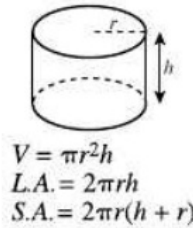
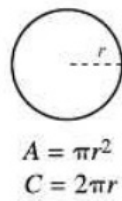
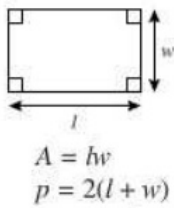
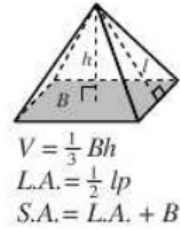
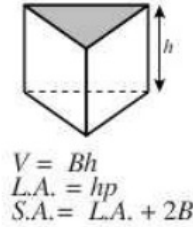
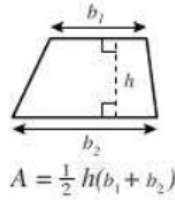
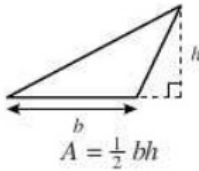
**Property of the Virginia Department of Education**

©2007 by the Commonwealth of Virginia, Department of Education, P.O. Box 2120, Richmond, Virginia 23218-2120. All rights reserved. Except as permitted by law, this material may not be reproduced or used in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, without written permission from the copyright owner. Commonwealth of Virginia public school educators may reproduce any portion of these released tests for non-commercial educational purposes without requesting permission. All others should direct their written requests to the Virginia Department of Education, Division of Student Assessment and School Improvement, at the above address or by e-mail to [Student\\_Assessment@doe.virginia.gov](mailto:Student_Assessment@doe.virginia.gov).



## Geometry Formula Sheet

### Geometric Formulas



### Geometric Symbols

Example	Meaning	Example	Meaning
$\angle A$	angle A	$\vec{AB}$	vector AB
$m\angle A$	measure of angle A		right angle
$\overline{AB}$	line segment AB	$AB \parallel CD$	Line AB is parallel to line CD.
AB	measure of line segment AB	$AB \perp CD$	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

$$\pi \approx 3.14$$

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



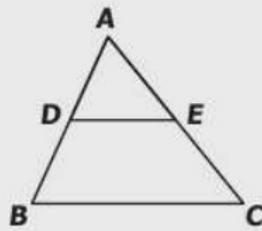
Geometry

---

**Directions**

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

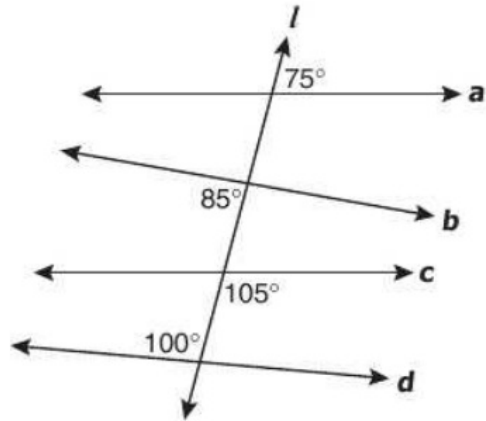
**SAMPLE**



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

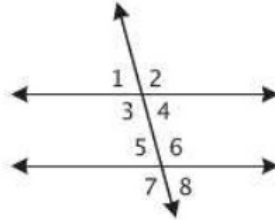
1 Transversal  $l$  cuts lines  $a$ ,  $b$ ,  $c$ , and  $d$ .



Which two lines are parallel?

- A  $a$  and  $c$
- B  $a$  and  $d$
- C  $b$  and  $c$
- D  $b$  and  $d$

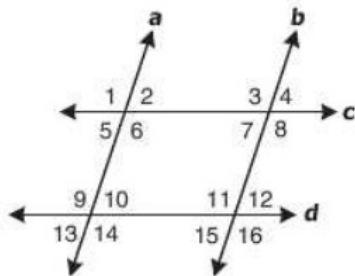
2



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  $72^\circ$ . What is the measure of one interior angle?
- A  $18^\circ$
  - B  $108^\circ$
  - C  $360^\circ$
  - D  $540^\circ$

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

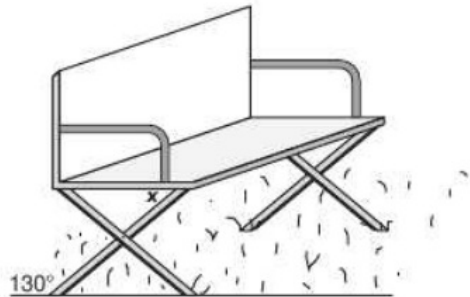


Which angle is *not* necessarily congruent to  $\angle 1$ ?

- F  $\angle 3$
- G  $\angle 9$
- H  $\angle 12$
- J  $\angle 16$



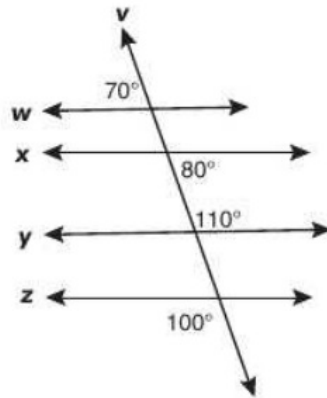
- 5 The support legs on a bench are attached in such a way that the angle made by one leg with the ground is  $130^\circ$ .



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  $50^\circ$
- B  $65^\circ$
- C  $90^\circ$
- D  $130^\circ$

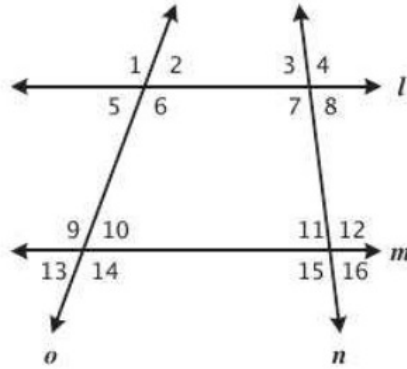
6 Line  $v$  is a transversal.



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  $x \parallel y$

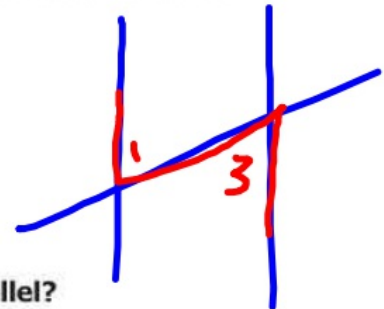
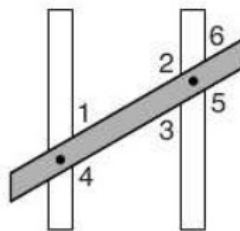
7



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

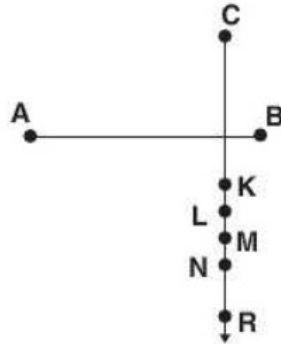
8 A carpenter nailed a board across two beams, forming the angles shown.



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  $m\angle 3 = m\angle 4$

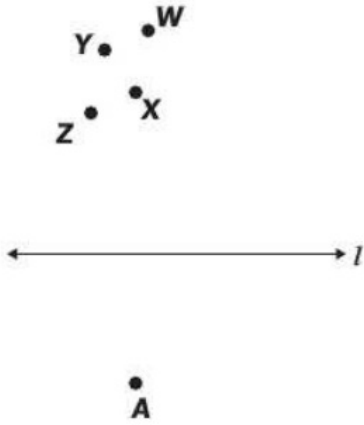
9



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

- A  $\overline{CK}$
- B  $\overline{CL}$
- C  $\overline{CM}$
- D  $\overline{CN}$

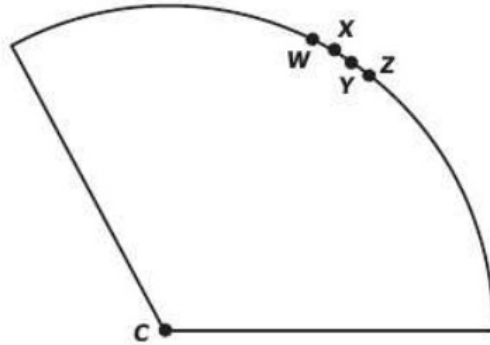
10



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”?

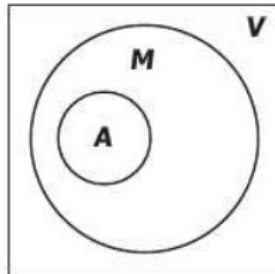
**A**  $q \rightarrow \sim p$

**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.

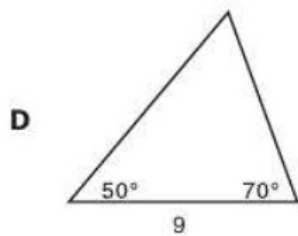
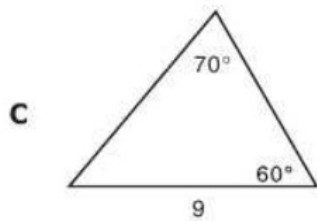
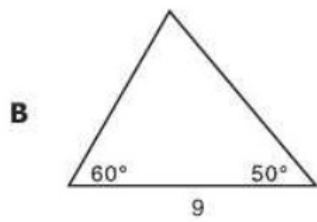
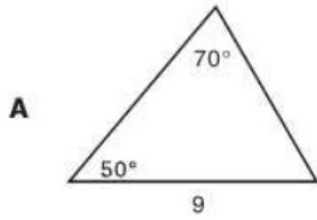


Based on the diagram, which is a valid conclusion?

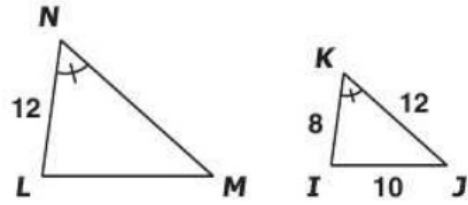
- F All automobiles are motorized vehicles.
- G All motorized vehicles are automobiles.
- H Some automobiles are not motorized vehicles.
- J No automobiles are motorized vehicles.



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



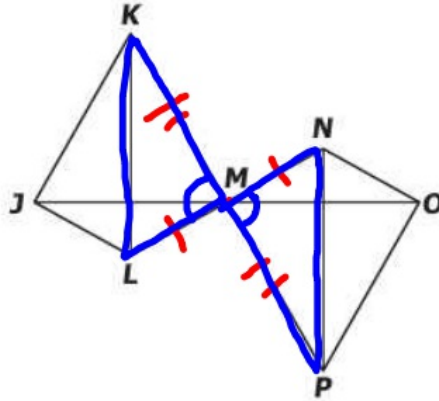
16



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

- F  $NM = 18$
- G  $LM = 18$
- H  $NM = 15$
- J  $LM = 10$

- 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?

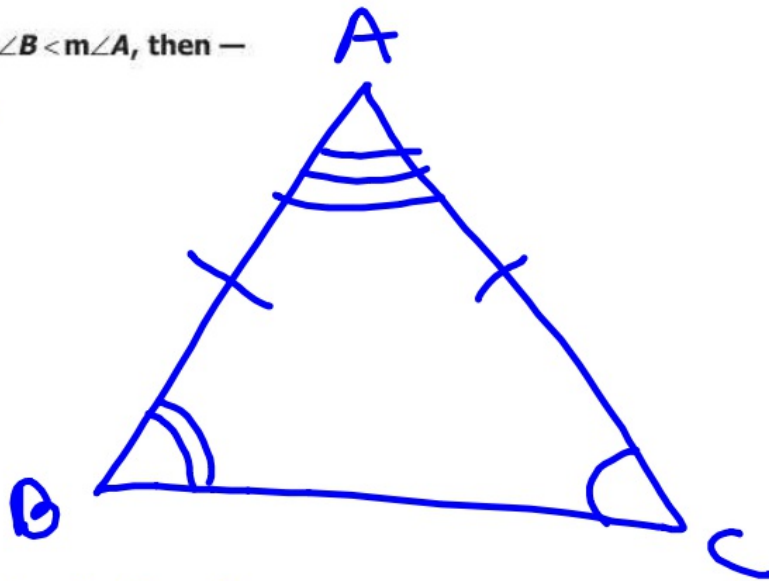
- A Angle-Side-Angle
  - B Side-Side-Side
  - C Side-Angle-Side**
  - D Angle-Angle-Side
- 18 Which of the following could *not* be the lengths of the sides of a triangle?
- F 6 ft, 3 ft, 9 ft
  - G 3 cm, 4 cm, 5 cm
  - H 4 in., 6 in., 8 in.
  - J 5 km, 2 km, 4 km

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

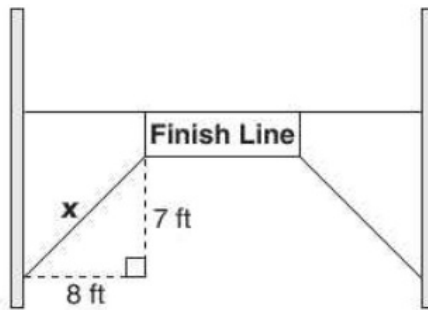
20 In  $\triangle ABC$ , if  $m\angle C < m\angle B < m\angle A$ , then —

- F  $AB < AC < BC$
- G  $AC < AB < BC$
- H  $AB < BC < CA$
- J  $BC < AB < CA$



$$AB < AC < BC$$

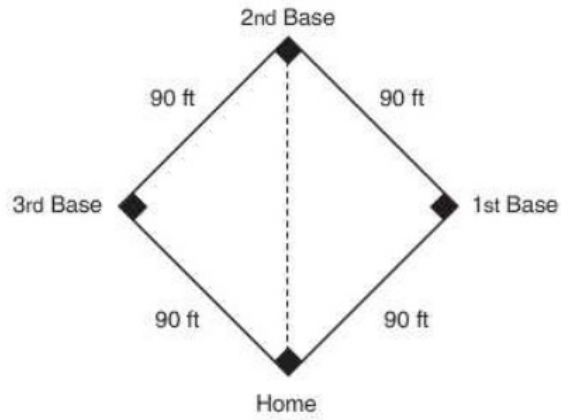
- 21 To mark the end of a race, a finish-line banner is stretched across the road as shown in the drawing.



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

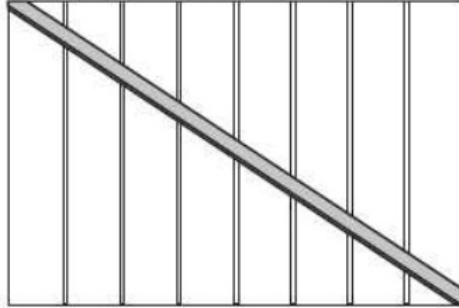
- 22 A baseball diamond is in the shape of a square, 90 feet on a side.



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

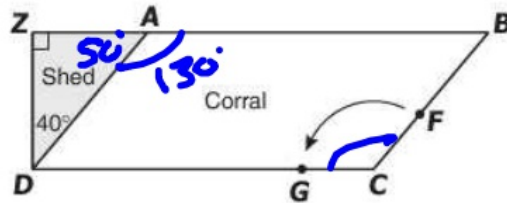
23



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

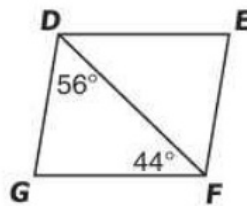
- 24 Gene's horse corral, labeled  $ABCD$  in the drawing, is shaped as a parallelogram and is adjacent to the shed, labeled  $ZAD$ .



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~~  $40^\circ$   
~~G~~  $50^\circ$   
 H  $130^\circ$   
 J  $140^\circ$

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

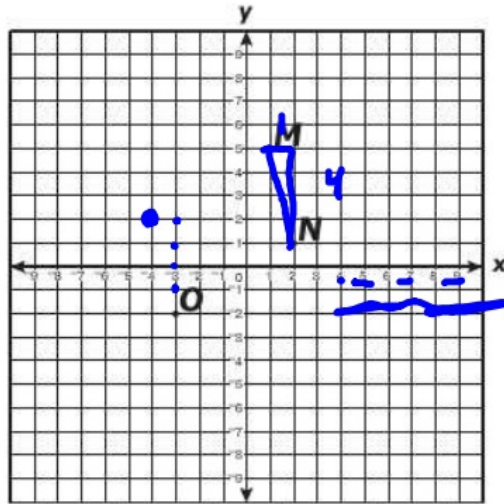


What is the measure of  $\angle DEF$ ?

- A  $44^\circ$   
 B  $56^\circ$   
 C  $80^\circ$   
 D  $100^\circ$



$(-4, 2)$



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  $x$ ?

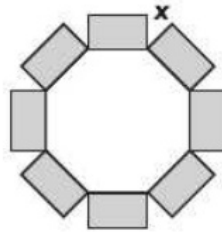
F -5

G -4

H -3

J 0

- 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  $30^\circ$   
B  $45^\circ$   
C  $60^\circ$   
D  $90^\circ$
- 28



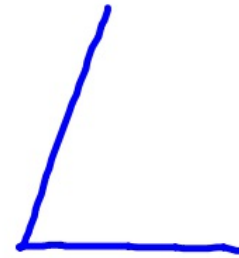
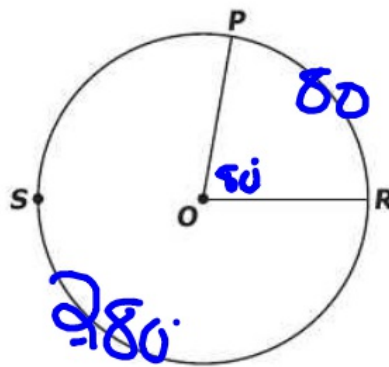
A portion of a regular polygon is shown. The polygon has —

- F 15 sides  
G 16 sides  
H 18 sides  
J 20 sides

29 Each interior angle of a regular polygon has a measure of  $162^\circ$ . The polygon has a total of —

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

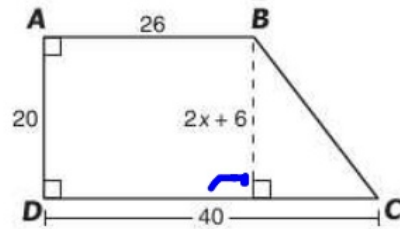
30 In circle  $O$ , the degree measure of  $\widehat{PSR}$  is  $280^\circ$ .



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

- ~~F  $160^\circ$~~
- G  $85^\circ$
- H  $80^\circ$
- ~~J  $40^\circ$~~

31

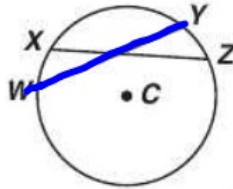


What is the value of  $x$  in trapezoid  $ABCD$ ?

- ~~A 17~~
- B 13
- C 10
- D 7

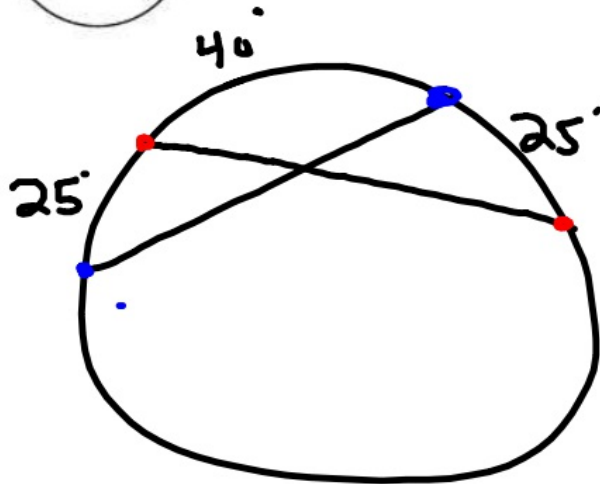
$$2x + 6 = 20$$

- 32 In circle  $C$ ,  $m\widehat{WX} = 25^\circ$ ,  $m\widehat{XY} = 40^\circ$ ,  $m\widehat{YZ} = 25^\circ$ , and  $WY = 24$  centimeters.



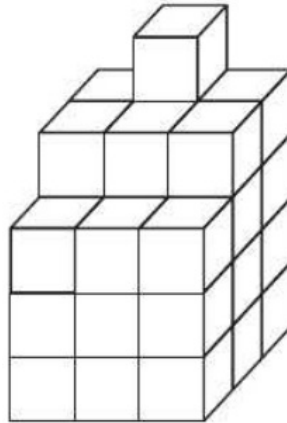
What is the length of  $\overline{XZ}$ ?

- ~~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.

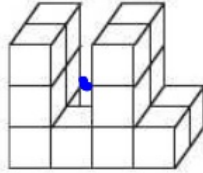
34



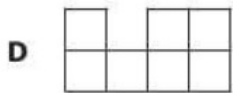
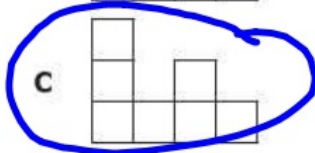
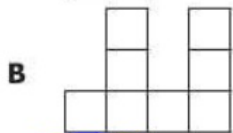
Assuming the solid is constructed from cubes measuring 1 unit on each edge and that the figure is completely solid, what is the volume of the cubic solid shown above?

- 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?



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

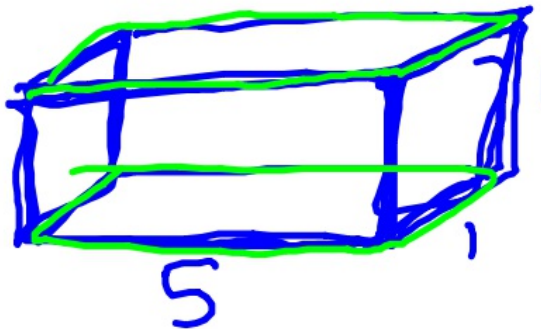
- F 267.9 cm<sup>3</sup>
- G 803.8 cm<sup>3</sup>
- H 1,607.7 cm<sup>3</sup>
- J 2,143.6 cm<sup>3</sup>

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

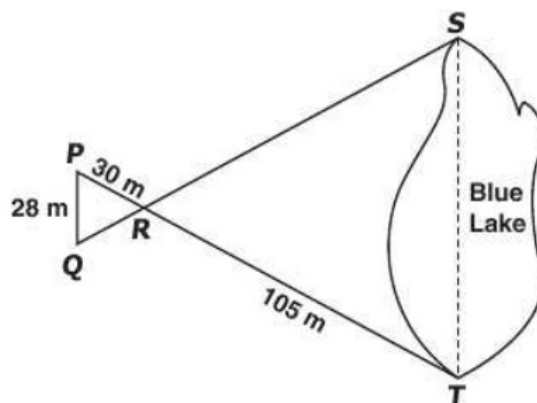
$$5 + 5 + 1 + 1$$

$$5 + 5$$



22

38

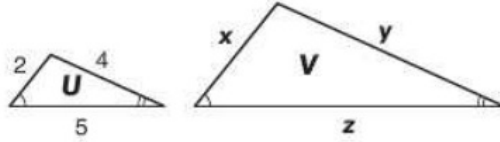


If  $\overrightarrow{PQ}$  is parallel to  $\overrightarrow{ST}$ , what is  $ST$ , the width of the lake?

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



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

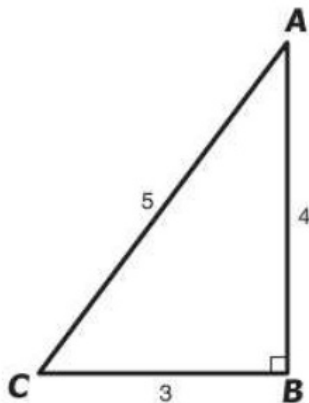
$$\frac{2}{x} = \frac{1}{2}$$

$$x = 4$$

$$\frac{4}{y} = \frac{1}{2}$$

$$y = 8$$

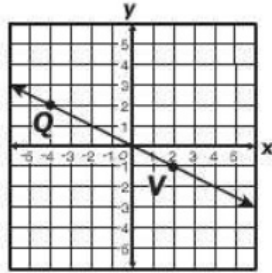
40 Right triangle  $ABC$  has the measures shown.



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

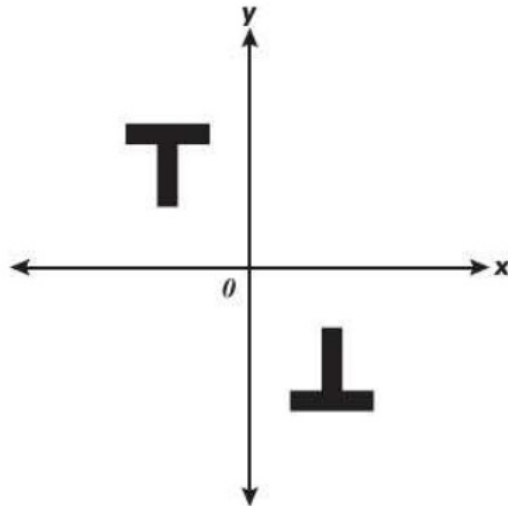
- F 0
- G 1
- H 2
- J 3

41



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

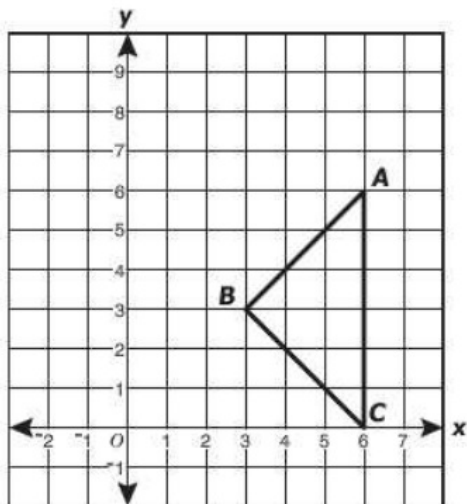
- A -2
- B  $-\frac{1}{2}$
- C  $\frac{1}{2}$
- D 2



**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**  $90^\circ$  rotation about the origin
- J**  $180^\circ$  rotation about the origin

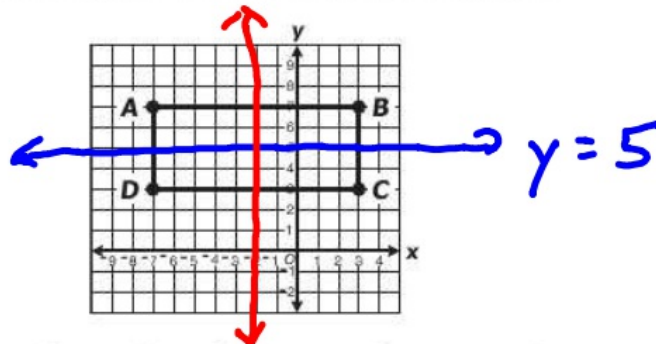
43 Triangle  $ABC$  is placed on a grid as shown.



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

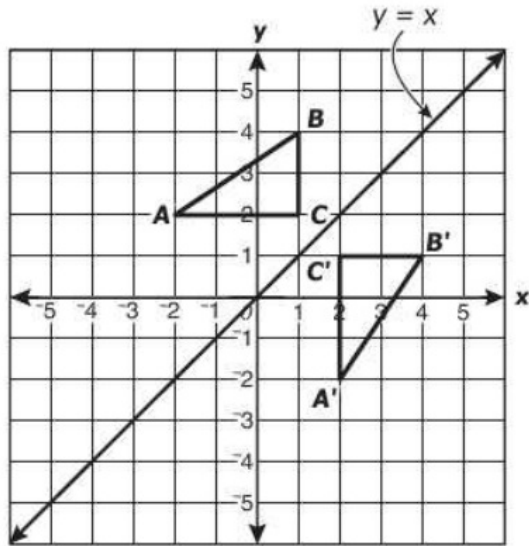
- A (1.5, 1.5)
- B (3, 3)
- C (4.5, 4.5)
- D (4.5, 1.5)

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  $y = x$



$\triangle A'B'C'$  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  $y = x$

**Answer Key-EOC021-M0117**

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



**Geometry, Core 1**

If you get this many items correct:	Then your converted scale score is:
0	000
1	182
2	217
3	238
4	254
5	266
6	277
7	286
8	294
9	302
10	309
11	315
12	321
13	327
14	332
15	338
16	343
17	348
18	353
19	358
20	363
21	368
22	372
23	377
24	382
25	387
26	391
27	396
<b>28</b>	<b>401</b>
29	406
30	411
31	417
32	422
33	428
34	434
35	441
36	448
37	455
38	464
39	473
40	483
41	496
<b>42</b>	<b>512</b>
43	533
44	568
45	600