

VIRGINIA STANDARDS OF LEARNING

Spring 2007 Released Test

END OF COURSE GEOMETRY

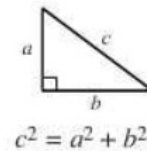
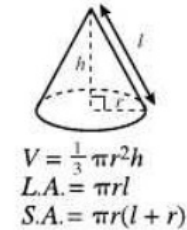
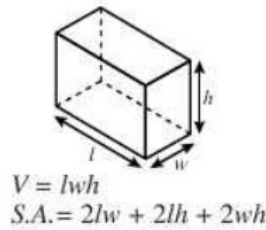
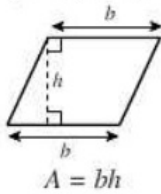
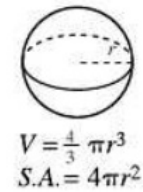
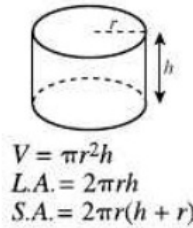
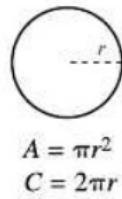
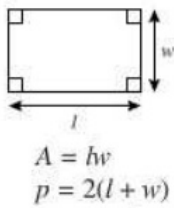
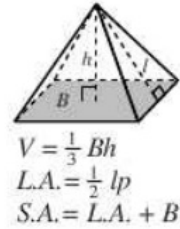
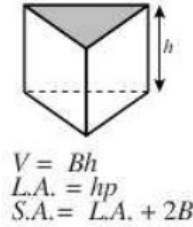
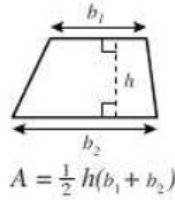
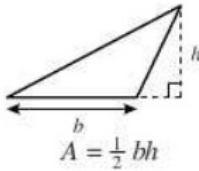
Form M0117, CORE 1

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Geometry Formula Sheet

Geometric Formulas



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

$$\pi \approx 3.14$$

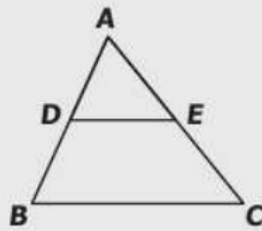
$$\pi \approx \frac{22}{7}$$

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.

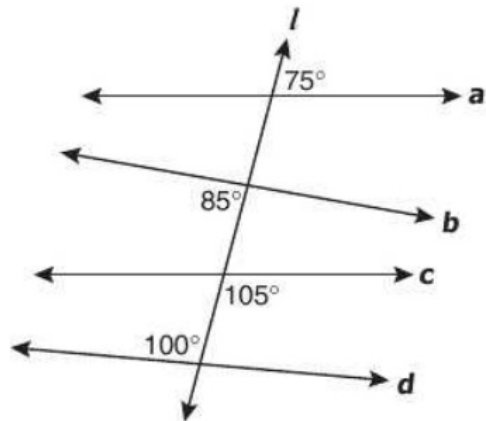
SAMPLE



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

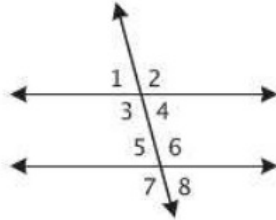
1 Transversal l cuts lines a , b , c , and d .



Which two lines are parallel?

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

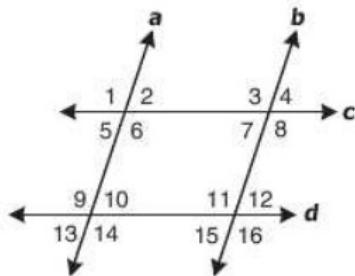
2



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° . What is the measure of one interior angle?
- A 18°
 - B 108°
 - C 360°
 - D 540°

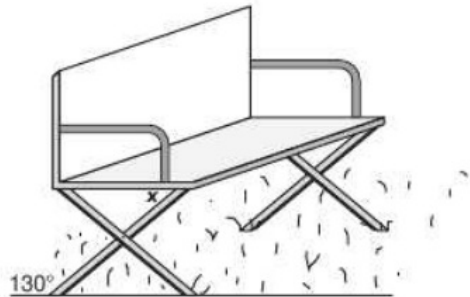
4 In this drawing, $a \parallel b$ and $c \parallel d$.



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

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

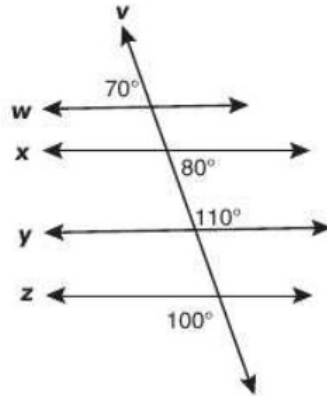
- 5 The support legs on a bench are attached in such a way that the angle made by one leg with the ground is 130° .



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°

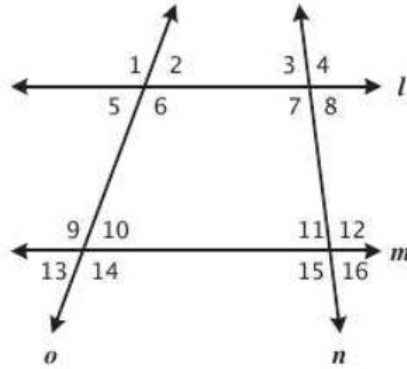
6 Line v is a transversal.



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 $x \parallel y$

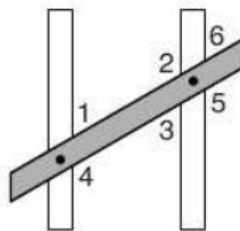
7



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

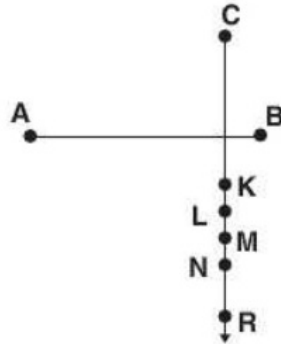
8 A carpenter nailed a board across two beams, forming the angles shown.



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 $m\angle 3 = m\angle 4$

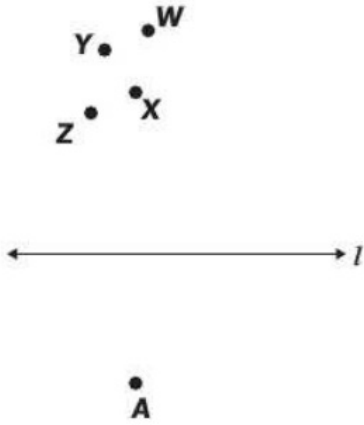
9



Which segment is congruent to \overline{AB} ?

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

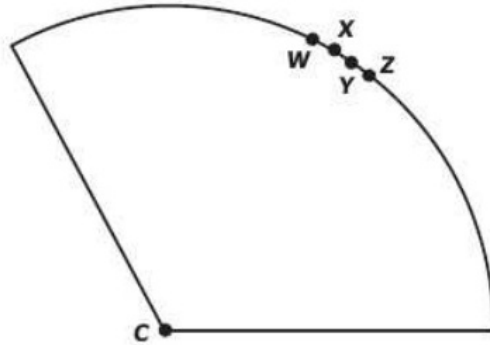
10



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”?

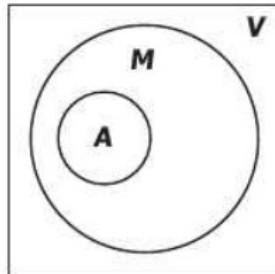
A $q \rightarrow \sim p$

B $\sim q \rightarrow p$

C $p \rightarrow \sim q$

D $\sim q \rightarrow \sim p$

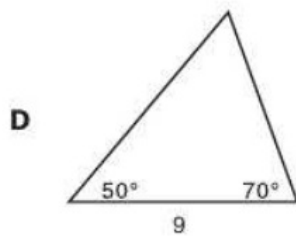
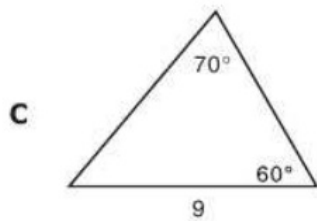
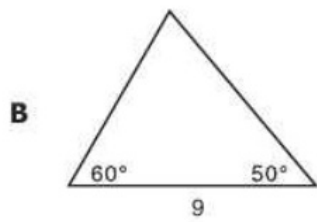
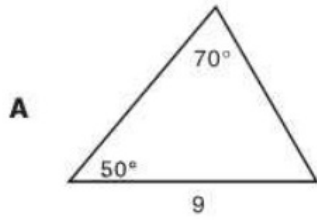
- 14 In the Venn diagram below, V represents the set of all vehicles, M represents the set of all motorized vehicles, and A represents the set of all automobiles.



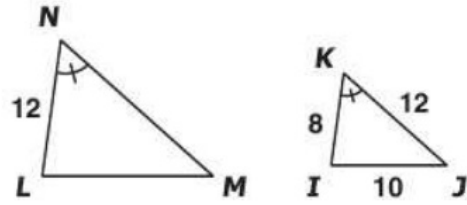
Based on the diagram, which is a valid conclusion?

- 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?



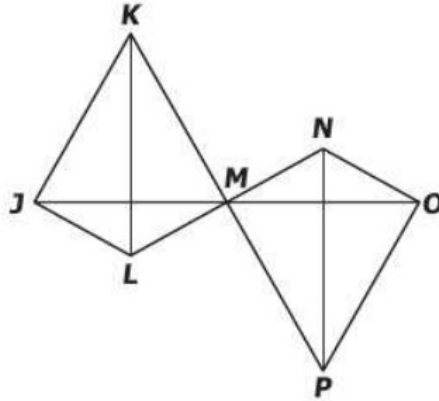
16



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 —

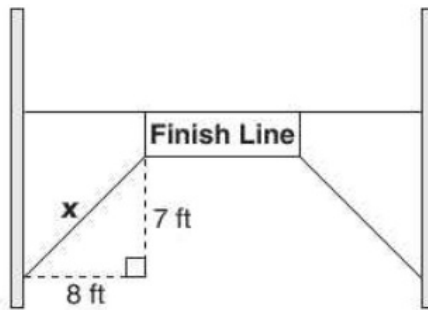
F $AB < AC < BC$

G $AC < AB < BC$

H $AB < BC < CA$

J $BC < AB < CA$

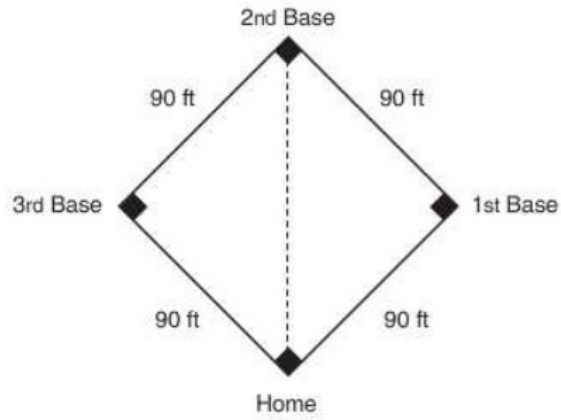
- 21 To mark the end of a race, a finish-line banner is stretched across the road as shown in the drawing.



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

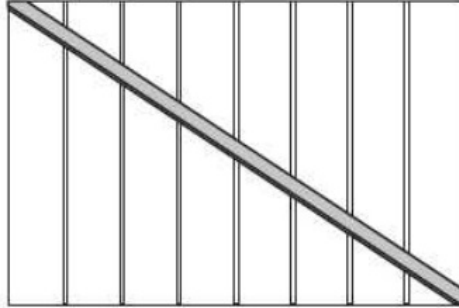
22 A baseball diamond is in the shape of a square, 90 feet on a side.



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

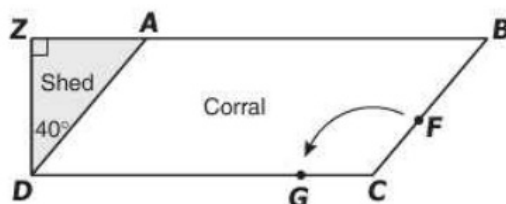
23



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

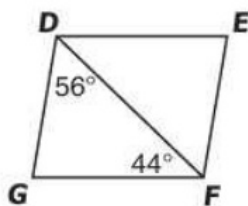
- A 12 ft
- B 13 ft
- C 14 ft
- D 15 ft

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



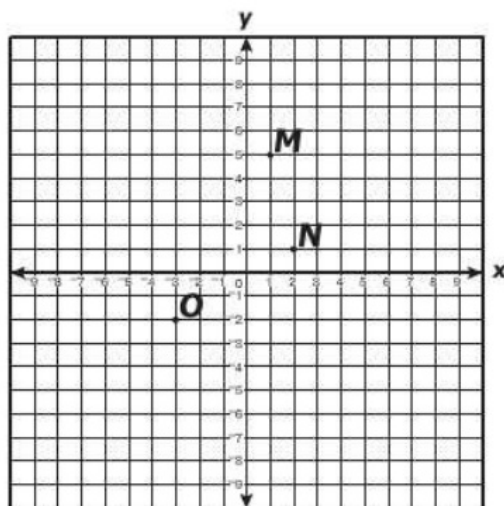
If a gate, labeled CF , opens all the way to the corral fence, position labeled CG , through how many degrees does the gate swing?

- 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 $\angle DEF$?

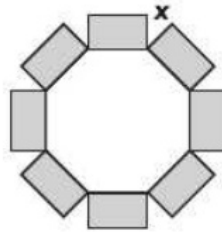
- A 44°
- B 56°
- C 80°
- D 100°



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°
- B 45°
- C 60°
- D 90°

28



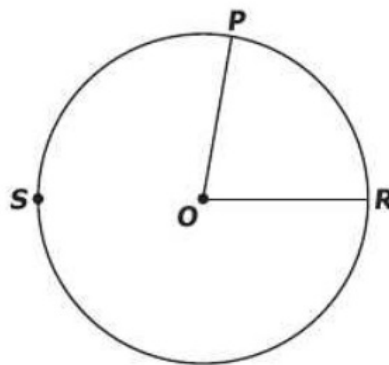
A portion of a regular polygon is shown. The polygon has —

- 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

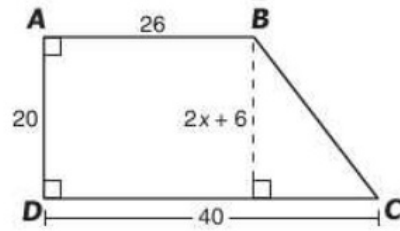
30 In circle O , the degree measure of \widehat{PSR} is 280° .



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

- F 160°
- G 85°
- H 80°
- J 40°

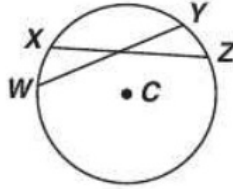
31



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

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

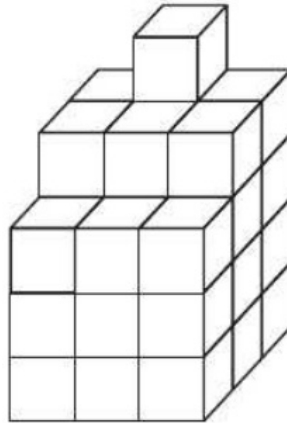
- 32 In circle C , $m\widehat{WX} = 25^\circ$, $m\widehat{XY} = 40^\circ$, $m\widehat{YZ} = 25^\circ$, and $WY = 24$ centimeters.



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.

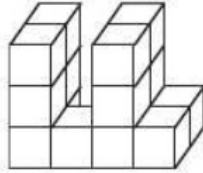
34



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?

- A
- B
- C
- D

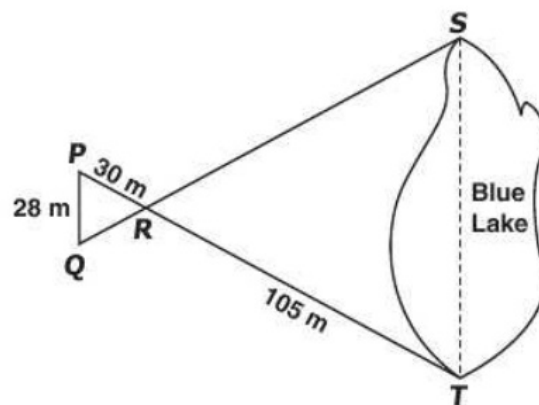
36 Which is closest to the volume of a sphere with a radius equal to 8 centimeters?

- 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

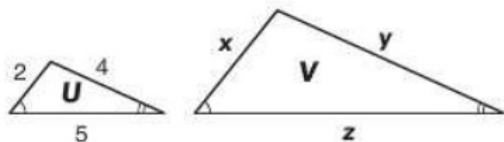
38



If \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

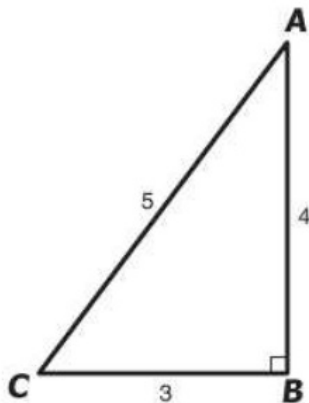
39 The ratio of the perimeter of $\triangle U$ to the perimeter of $\triangle V$ is 1:2.



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

- A 3
- B 6
- C 12
- D 18

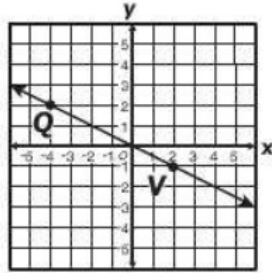
40 Right triangle ABC has the measures shown.



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

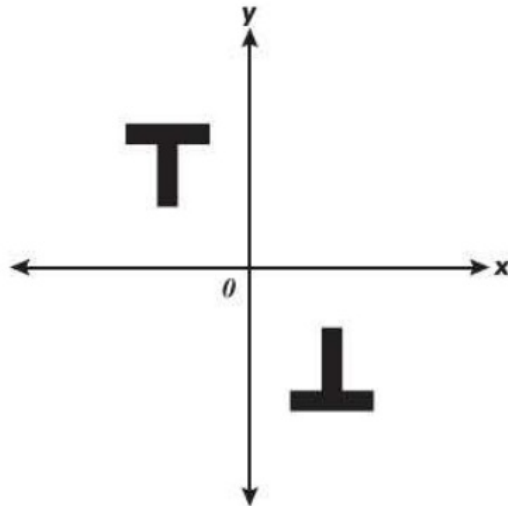
- F 0
- G 1
- H 2
- J 3

41



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

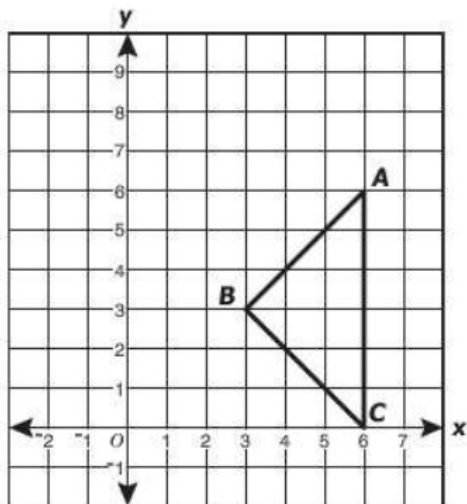
- A -2
- B $-\frac{1}{2}$
- C $\frac{1}{2}$
- D 2



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° rotation about the origin
- J** 180° rotation about the origin

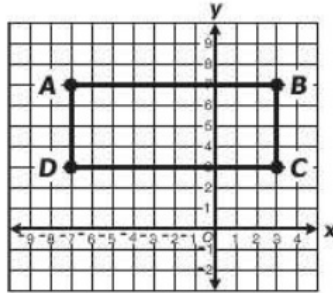
43 Triangle ABC is placed on a grid as shown.



The apparent midpoint of \overline{AB} is —

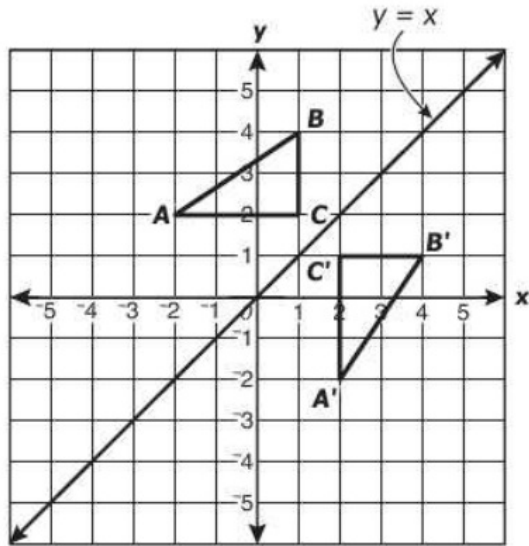
- A (1.5, 1.5)
- B (3, 3)
- C (4.5, 4.5)
- D (4.5, 1.5)

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

Test Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
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
28	401
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
42	512
43	533
44	568
45	600

VIRGINIA STANDARDS OF LEARNING

Released Test

GEOMETRY

2009 Mathematics Standards of Learning

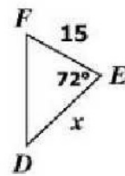
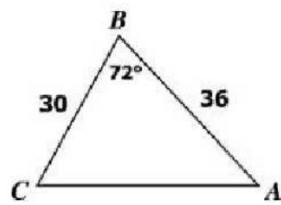
Released Spring 2014

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SAMPLE A

For what value of x is $\triangle ABC \sim \triangle DEF$?



- A 18
- B 21
- C 25
- D 72

Directions: Type your answer in the box.

SAMPLE B

What is the total number of lines of symmetry for this figure?



Let p represent

Two angles are vertical angles.

Let q represent

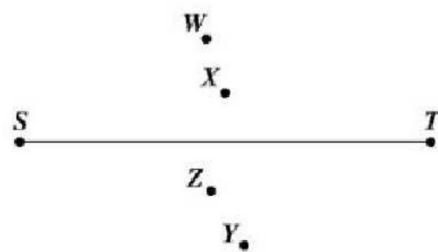
The angles are congruent.

What is the symbolic representation of the following statement?

If two angles are congruent, then the angles are vertical angles.

- A $q \rightarrow p$
- B $p \rightarrow q$
- C $\sim q \rightarrow \sim p$
- D $\sim p \rightarrow \sim q$

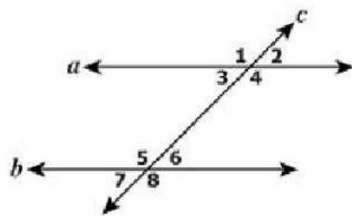
Beth is drawing the perpendicular bisector of \overline{ST} .



Which point is on the perpendicular bisector of \overline{ST} ?

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

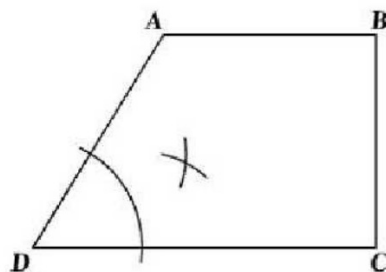
In this figure, parallel lines a and b are intersected by line c .



Which pair of angles is NOT supplementary?

- A $\angle 1$ and $\angle 6$
- B $\angle 3$ and $\angle 8$
- C $\angle 2$ and $\angle 7$
- D $\angle 4$ and $\angle 6$

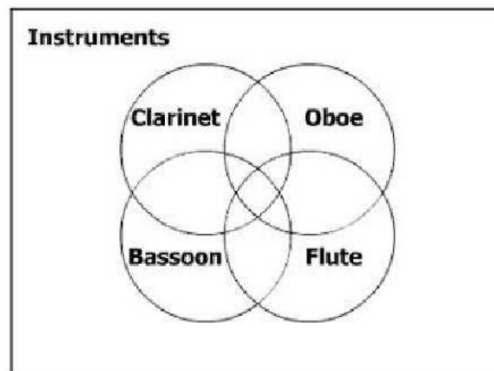
What type of construction is illustrated in the figure?



- A The bisection of $\angle D$
- B The bisection of \overline{BD}
- C An angle congruent to $\angle D$
- D A line segment congruent to \overline{AB}

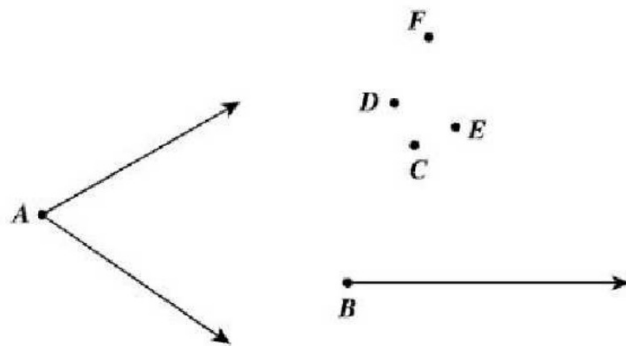
Directions: Click on the diagram to place a " * " in each region you want to select. You must select all correct regions.

This Venn diagram represents students who play instruments in the orchestra.



Identify each region of the Venn diagram that represents students who play only the flute and the oboe.

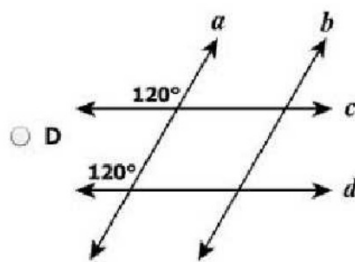
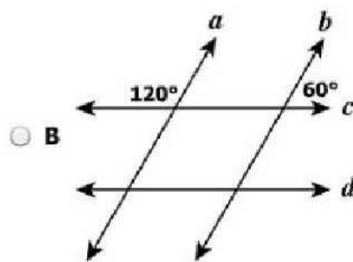
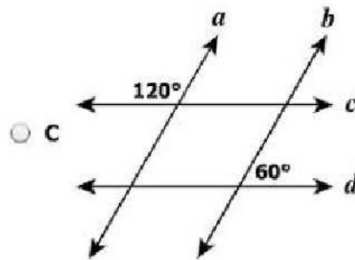
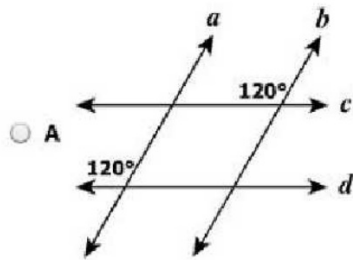
An angle congruent to angle A is being constructed.



Which ray could be drawn to construct an angle congruent to $\angle A$?

- A \overrightarrow{BC}
- B \overrightarrow{BD}
- C \overrightarrow{BE}
- D \overrightarrow{BF}

Which diagram shows a pair of angle measures that prove lines a and b are parallel?



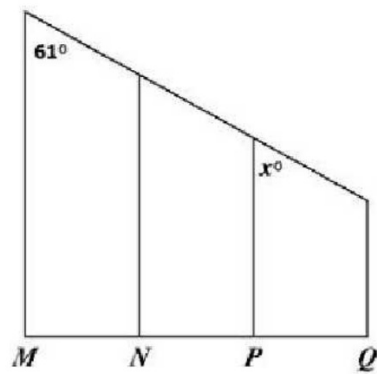
Which is a valid conclusion that can be drawn from these statements?

If a quadrilateral is a rhombus, then it is a parallelogram.

If a quadrilateral is a parallelogram, then its opposite angles are congruent.

- A** Every quadrilateral is a rhombus.
- B** Every parallelogram is a rhombus.
- C** Opposite angles of a rhombus are congruent.
- D** Opposite angles of a quadrilateral are congruent.

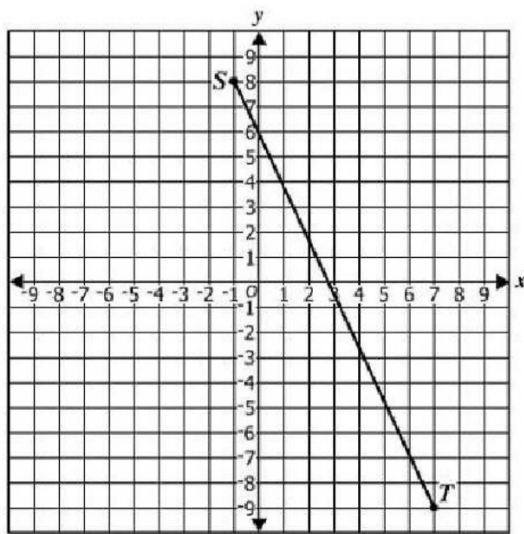
This figure shows parallel stair railings through points M , N , P , and Q .



What is the value of x ?

- A 29
- B 45
- C 61
- D 119

Given: $S(-1, 8)$ and $T(7, -9)$

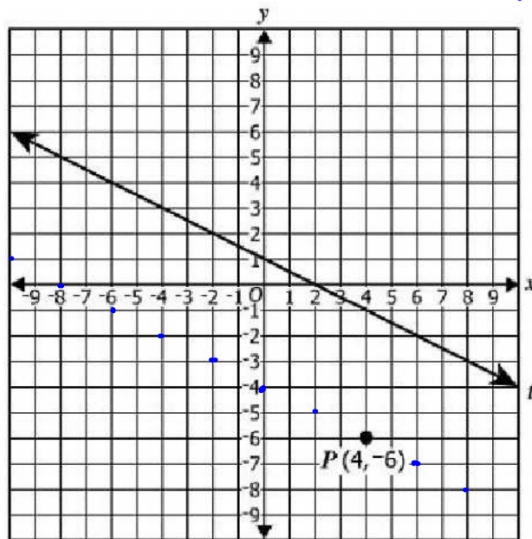


What is the length of \overline{ST} ?

- A $\sqrt{23}$
- B 5
- C $5\sqrt{13}$
- D $\sqrt{353}$

Instructions: Click on the grid to plot the point you want to select. You must plot a point other than point P .

Line l contains the points $(-8, 5)$ and $(8, -3)$. Plot a point other than point P with integral coordinates that is on a line parallel to l and passes through point P .



$$m = \frac{\Delta y}{\Delta x} = \frac{5 - (-3)}{-8 - 8}$$

$$\frac{8}{-16}$$

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

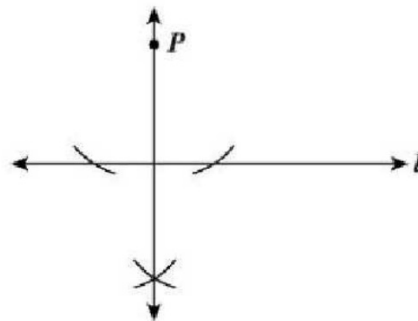
$$(2, -5)$$

$$(0, -4)$$

$$(-2, -3)$$

$$(-4, -2)$$

Which best describes the construction in the diagram shown?



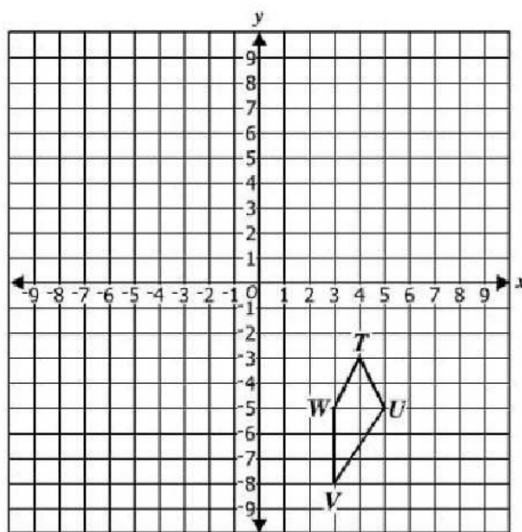
- A The bisector of a line segment
- B A line segment congruent to a given line segment
- C A perpendicular to a given line at a point on the line
- D A perpendicular to a given line from a point not on the line

Which is the inverse of the following statement?

If the measure of an angle is 90° , then it is a right angle.

- A** If the measure of an angle is not 90° , then it is not a right angle.
- B** If the measure of an angle is not 90° , then it is a right angle.
- C** If an angle is not a right angle, then its measure is not 90° .
- D** If an angle is a right angle, then its measure is 90° .

Quadrilateral $TUVW$ is shown.

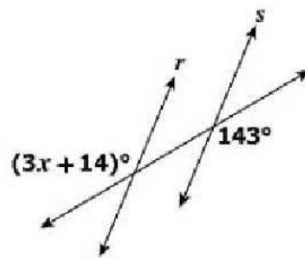


If $TUVW$ is reflected across the line $y = x$, what are the coordinates of V' ?

- A (8, -3)
- B (3, 8)
- C (-3, -8)
- D (-8, 3)

Directions: Type your answer in the box.

Lines r and s are cut by a transversal.



What value of x proves that $r \parallel s$?

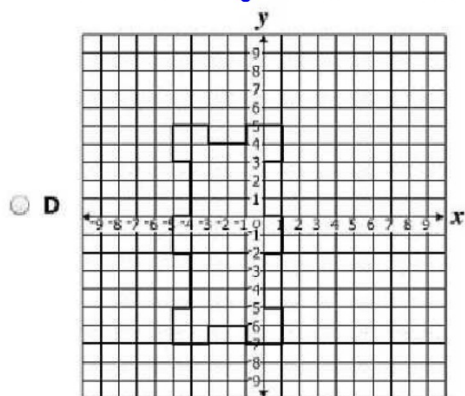
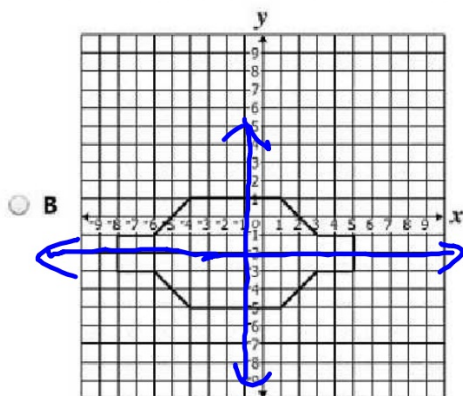
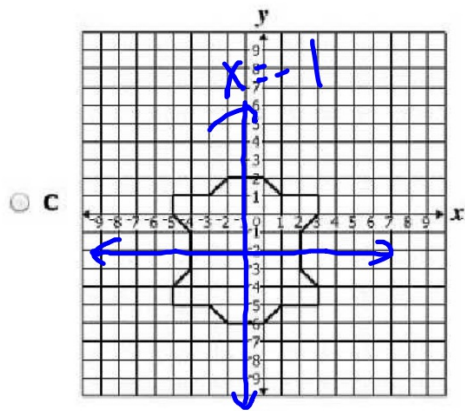
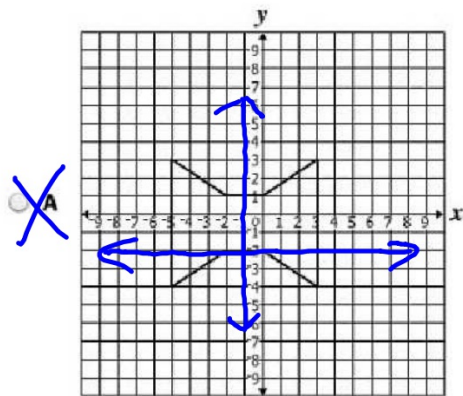
$x =$

Given: $P(5, 7)$ and $T(-3, 3)$

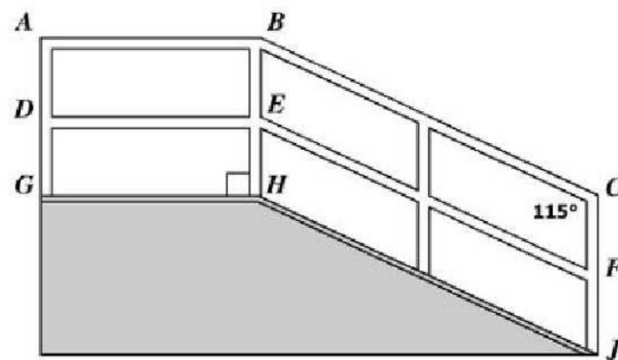
What is the slope of \overleftrightarrow{PT} ?

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

For which polygon are both $x = -1$ and $y = -2$ lines of symmetry?



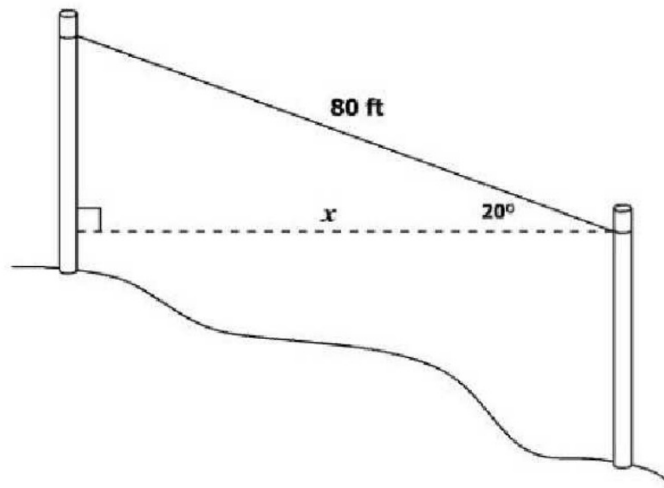
The figure represents a ramp with handrails. Segments AB and DE are parallel to \overline{GH} . Segments BC and EF are parallel to \overline{HJ} . Segments AG and BH are parallel to \overline{CJ} .



If $m\angle JCB = 115^\circ$, what is $m\angle CBA$?

- A 65°
- B 90°
- C 115°
- D 155°

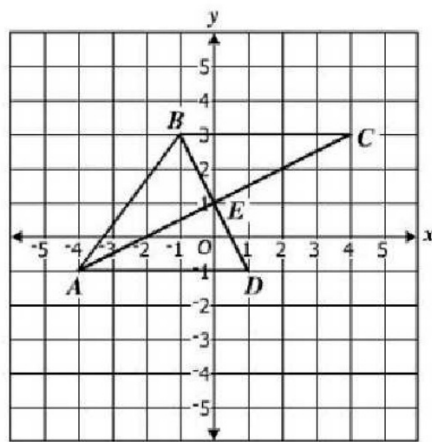
Reuben attached a wire between two poles on a hill as shown.



Which is closest to x , the distance between the two poles?

- A 27 ft
- B 29 ft
- C 60 ft
- D 75 ft

Triangles ABE , ADE , and CBE are shown on the coordinate grid, and all the vertices have coordinates that are integers.



Which statement is true?

- A No two triangles are congruent.
- B Only $\triangle ABE$ and $\triangle CBE$ are congruent.
- C Only $\triangle ABE$ and $\triangle ADE$ are congruent.
- D Triangle ABE , $\triangle ADE$, and $\triangle CBE$ are all congruent.

Directions: Click and drag each selected number to the correct box.

The lengths of two sides of a triangle are 24 inches and 43 inches. What is the range of possible lengths, in inches, for the third side, x , of this triangle?

$$\boxed{19} < x < \boxed{67}$$

9	19	20	24	30	33.5	67	101.5
---	----	----	----	----	------	----	-------

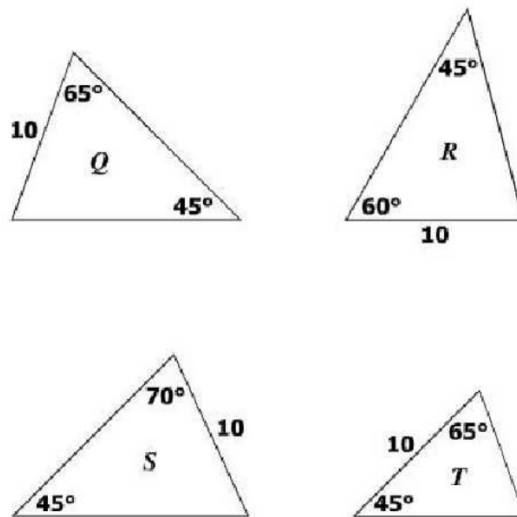
$$\begin{array}{r} 43 \\ - 24 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 43 \\ + 24 \\ \hline 67 \end{array}$$

Which of the following sets of lengths can represent the measures of the sides of a right triangle?

- A** 4, 5, 6
- B** 5, 12, 15
- C** 8, 10, 17
- D** 20, 21, 29

Given the measures shown in the diagram, which two triangles are congruent?



- A Q and S
- B R and T
- C R and S
- D Q and T

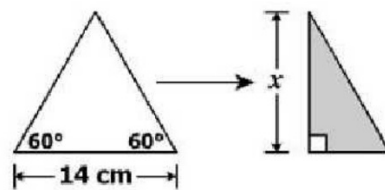
Part of a marching band formed a triangle made with trumpet players on one side, clarinet players on one side, and flute players on the third side.

- **The angle formed by the trumpet and flute players measured 45° .**
- **The angle formed by the flute and clarinet players measured 68° .**

Which orders the sides of this triangle from least to greatest using the instrument names?

- A** Clarinet, trumpet, flute
- B** Clarinet, flute, trumpet
- C** Trumpet, flute, clarinet
- D** Flute, trumpet, clarinet

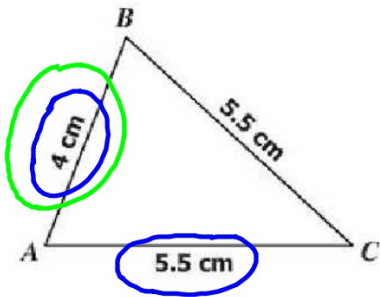
An equilateral triangle is folded in half.



What is x , the height of the equilateral triangle?

- A $14\sqrt{3}$ cm
- B 14 cm
- C $7\sqrt{3}$ cm
- D 7 cm

Look at this triangle.

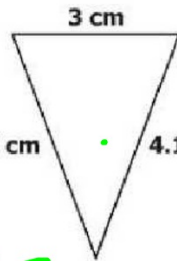


$$\frac{4}{3} = \frac{5.5}{5.83}$$

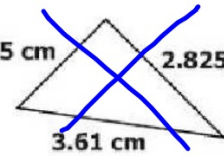
X

Which triangle is similar to the given triangle?

- A 4.125 cm 4.125 cm

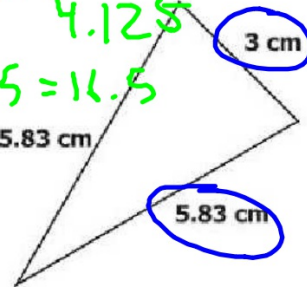


- C 2.25 cm 2.825 cm

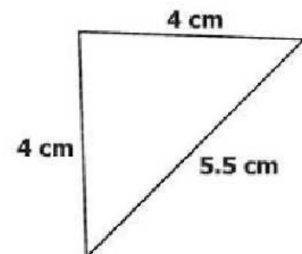


$$\frac{4}{3} = \frac{5.5}{4.125}$$
$$16.5 = 16.5$$

- B 5.83 cm

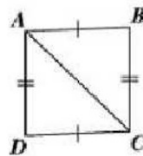


- D



Directions: Click and drag each selected reason to the correct box.

Given: Figure $ABCD$ with diagonal \overline{AC}
 $\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$

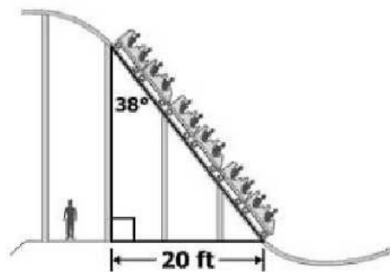


Complete the proof of $\triangle ABC \cong \triangle CDA$ by selecting the reasons for the last two statements.

Statements	Reasons
$\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$	Given
$\overline{AC} \cong \overline{AC}$	
$\triangle ABC \cong \triangle CDA$	

- Definition of congruent triangles
- Reflexive property
- Side-Angle-Side (SAS) Theorem
- Side-Side-Side (SSS) Theorem
- Hypotenuse-Leg (HL) Theorem
- Given

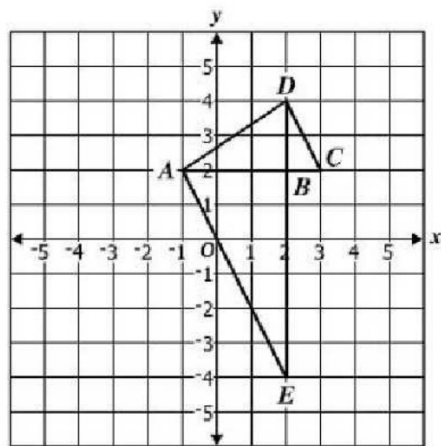
A spectator is viewing the six cars of a roller coaster as it travels down a hill at an amusement park.



Which is closest to the total length of the six cars?

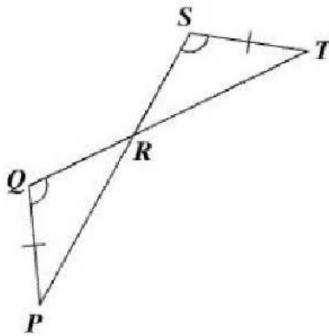
- A 12.3 ft
- B 15.8 ft
- C 25.6 ft
- D 32.5 ft

Three triangles that do not overlap are shown on the coordinate grid. The coordinates of all vertices are integers.



Which statement is true?

- A $\triangle ABD \sim \triangle EBA$
- B $\triangle ABD \sim \triangle DBC$
- C $\triangle CBD \sim \triangle ABE$
- D $\triangle CBD \sim \triangle EBA$



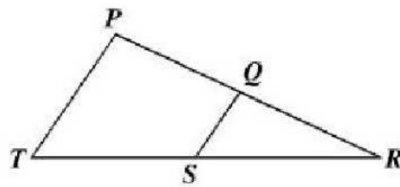
Using the information given, which congruence postulate or theorem can be used to prove that $\triangle PQR \cong \triangle TSR$?

- A Side-Side-Side Postulate
- B Side-Angle-Side Postulate
- C Hypotenuse-Leg Theorem
- D Angle-Angle-Side Theorem

Which could be the lengths of three sides of a triangle?

- A** 6 cm, 14 cm, 8 cm
- B** 9 cm, 11 cm, 21 cm
- C** 8.5 cm, 17 cm, 10.6 cm
- D** 14 cm, 4.7 cm, 4.7 cm

Given: Q lies on \overline{PR} and S lies on \overline{RT}

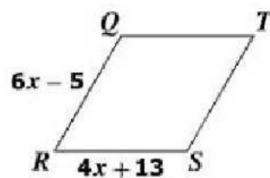


Which condition proves $\triangle PRT \sim \triangle QRS$?

- A $\angle PQS \cong \angle TSQ$
- B $\angle PTR \cong \angle TPR$
- C $\frac{QS}{PT} = \frac{QR}{SR}$
- D $\frac{QR}{PR} = \frac{SR}{TR}$

Directions: Type your answer in the box.

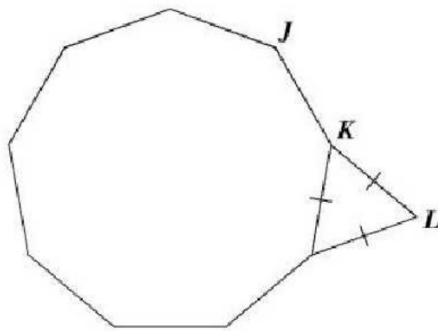
Given: Parallelogram $QRST$ where $QR = 6x - 5$ and $RS = 4x + 13$



What value of x proves this parallelogram is a rhombus?

$x =$

The floor plan for a modern home is modeled by the composite of the regular nonagon and triangle shown.



What is the measure of $\angle JKL$?

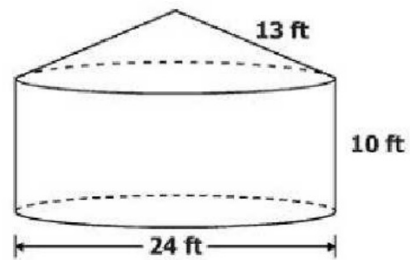
- A 150°
- B 160°
- C 165°
- D 175°

Given: Circle P with center at $(-4, 1)$

Which equation could represent circle P ?

- A** $(x - 4)^2 + (y - 1)^2 = 41$
- B** $(x - 4)^2 + (y + 1)^2 = 41$
- C** $(x + 4)^2 + (y - 1)^2 = 41$
- D** $(x + 4)^2 + (y + 1)^2 = 41$

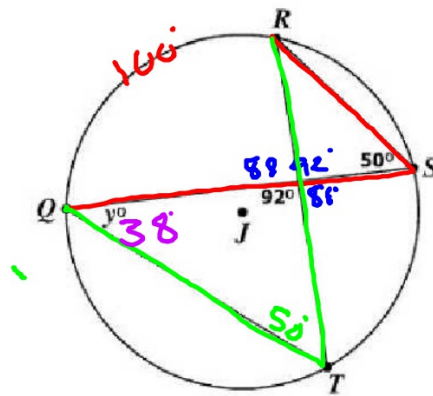
This container is composed of a right circular cylinder and a right circular cone.



Which is closest to the surface area of the container?

- A 490 ft^2
- B 754 ft^2
- C $1,243 \text{ ft}^2$
- D $1,696 \text{ ft}^2$

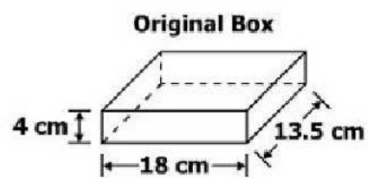
Given: Circle J



What is the value of y ?

- A 38
- B 50
- C 88
- D 92

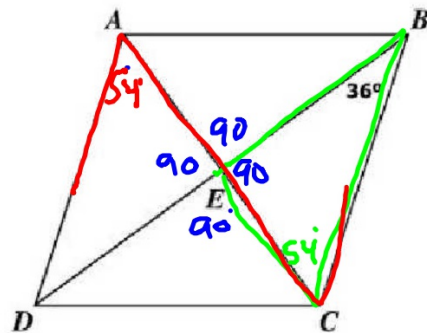
A cell phone box in the shape of a rectangular prism is shown. The height of the box is 4 cm.



The height of the original box will be increased by 3.5 centimeters so a new instruction manual and an extra battery can be included. Which is closest to the total surface area of the new box?

- A 479 cm²
- B 707 cm²
- C 738 cm²
- D 959 cm²

Parallelogram $ABCD$ is a **rhombus** with $m\angle EBC = 36^\circ$.



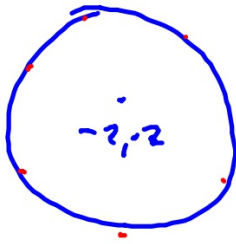
What is the $m\angle DAE$?

- A 36°
- B 54°
- C 108°
- D 144°

Circle O has a center at $(-2, -2)$ and a diameter of 10 units.

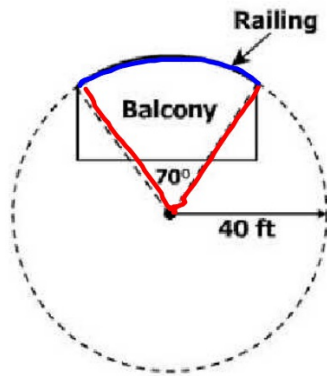
Which point lies on circle O ?

- A $(-6, -5)$
- B ~~$(-7, -2)$~~
- C $(6, 4)$
- D $(8, 8)$



$$C: (x+2)^2 + (y+2)^2 = 25$$
$$(-6+2)^2 + (-5+2)^2 = 25 \checkmark$$

An architect used this diagram to design a curved balcony. She drew a circle with a radius of 40 feet and a central angle of 70° to determine the length of railing needed for the balcony.



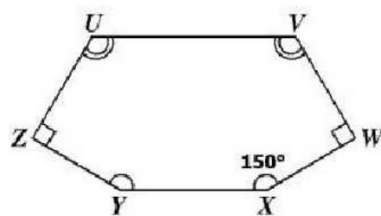
$$\frac{70}{360} \cdot \text{Circumference}$$

$$\frac{70}{360} \cdot \pi \cdot 80$$

Which is closest to the length of railing needed for the curved section of the balcony?

- ~~A 24 ft~~
- B 49 ft
- ~~C 255 ft~~
- ~~D 977 ft~~

A polygon is shown.

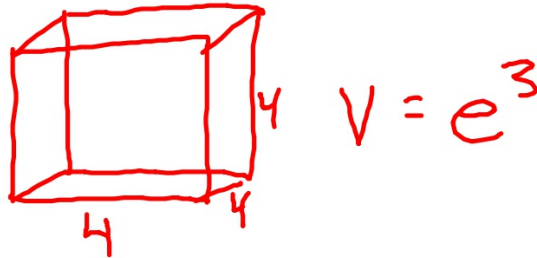


What is the measure of $\angle U$?

- A 60°
- B 90°
- C 120°
- D 240°

The volume of a cube is 64 cubic centimeters. What is the surface area of the cube?

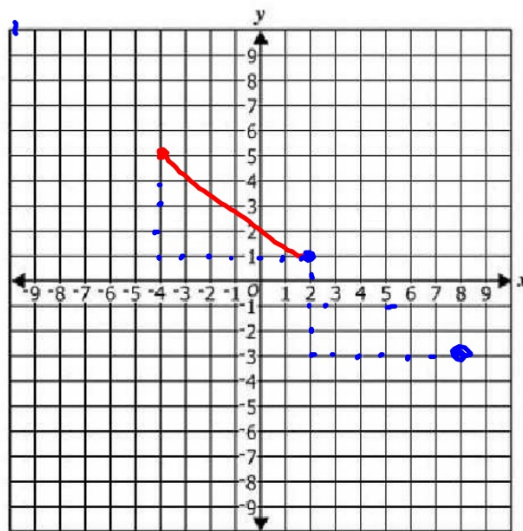
- A 16cm^2
- B 96cm^2
- C 256cm^2
- D 384cm^2



$$S.A. = 16 \times 6 = 96$$

2007/2014

The diagonals of rectangle $KLMN$ intersect at the point $(2, 1)$. One of the vertices of rectangle $KLMN$ is located at $(-4, 5)$.

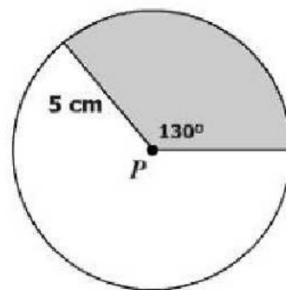


6/5

Which of the following could be the location of another vertex of this rectangle?

- A $(8, -3)$
- B $(3, -1)$
- C $(-2, 3)$
- D $(-10, 9)$

Given: Circle P



Which is closest to the area of the shaded sector of circle P ?

- A 11 cm^2
- B 28 cm^2
- C 50 cm^2
- D 78 cm^2

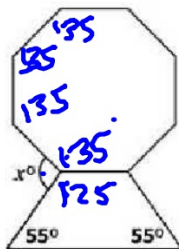
Directions: Click and drag each selected number to the correct box.

The ratio of the lengths of the radii of two spheres is 3:5. What is the ratio of the volumes of these two spheres?

<input type="text"/>	:	<input type="text"/>
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1	3	5	9	15	25	27	125
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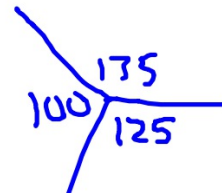
This figure is composed of an isosceles trapezoid and a regular octagon.



$$\frac{360}{8} = 45^\circ$$

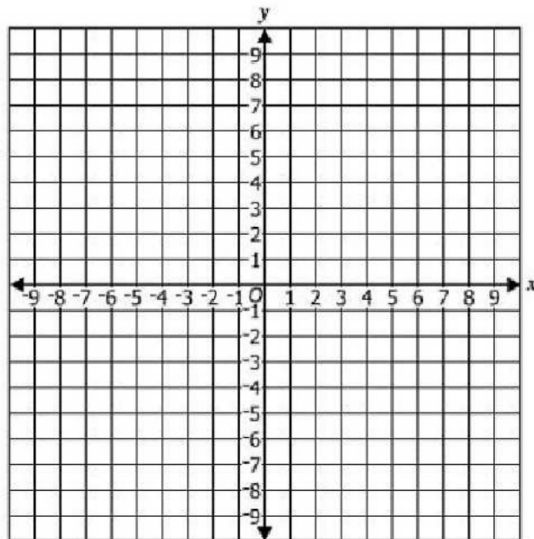
What is the value of x ?

- A 100
- B 125
- C 135
- D 190

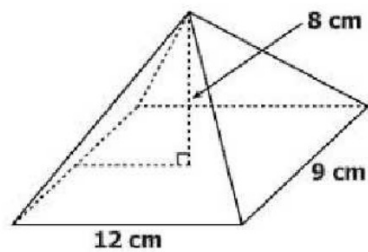


Directions: Click on the grid to plot the point you want to select.

Plot the center of the circle defined by the equation $(x + 4)^2 + (y - 5)^2 = 3^2$.



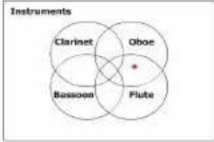
A rectangular pyramid is shown.



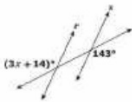
What is the volume of the pyramid?

- A 864 cm^3
- B 432 cm^3
- C 288 cm^3
- D 108 cm^3


**Geometry
Released Test Spring 2014
Answer Key**

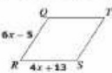
Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
1	MC	A	001	Reasoning, Lines, and Transformations
2	MC	B	001	Reasoning, Lines, and Transformations
3	MC	C	001	Reasoning, Lines, and Transformations
4	MC	A	001	Reasoning, Lines, and Transformations
5	TEI	<p>The region that is common to both the Oboe circle and the Flute circle, but no other circle, as shown in the image below. This region, and only this region, must contain a star.</p> <div style="border: 1px solid gray; padding: 5px;"> <p style="font-size: small;">Directions: Click on the diagram to place a "*" in each region you want to select. You must select all correct regions.</p> <p style="text-align: center; font-size: x-small;">This Venn diagram represents students who play instruments in the orchestra.</p> <div style="text-align: center;">  </div> <p style="font-size: x-small;">Identify each region of the Venn diagram that represents students who play only the flute and the oboe.</p> </div>	001	Reasoning, Lines, and Transformations
6	MC	A	001	Reasoning, Lines, and Transformations
7	MC	B	001	Reasoning, Lines, and Transformations

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
8	MC	C	001	Reasoning, Lines, and Transformations
9	MC	C	001	Reasoning, Lines, and Transformations
10	MC	D	001	Reasoning, Lines, and Transformations
11	TEI	Any ONE of these points must be plotted on the coordinate plane: $(10,-9)$, $(8,-8)$, $(6,-7)$, $(2,-5)$, $(0,-4)$, $(-2,-3)$, $(-4,-2)$, $(-6,-1)$, $(-8,0)$ or $(-10,1)$ One of these points, $(2,-5)$, is shown on the coordinate plane below. Directions: Click on the grid to plot the point you want to select. You must plot a point other than point P . Line l contains the points $(-8, 5)$ and $(8, -3)$. Plot a point other than point P with integral coordinates that is on a line parallel to l and passes through point P .	001	Reasoning, Lines, and Transformations
12	MC	D	001	Reasoning, Lines, and Transformations
13	MC	A	001	Reasoning, Lines, and Transformations
14	MC	D	001	Reasoning, Lines, and Transformations

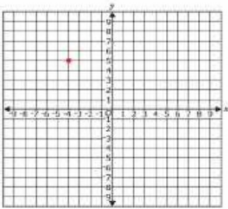
Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
15	TEI	<p>Typed Response: 43 (and all equivalent answers)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Directions: Type your answer in the box.</p> <p>Lines r and s are cut by a transversal.</p>  <p>What value of x proves that $r \parallel s$?</p> <p>$x =$ <input type="text" value="43"/></p> </div>	001	Reasoning, Lines, and Transformations
16	MC	C	001	Reasoning, Lines, and Transformations
17	MC	C	001	Reasoning, Lines, and Transformations
18	MC	D	001	Reasoning, Lines, and Transformations
19	MC	D	002	Triangles
20	MC	D	002	Triangles

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
21	TEI	<p>The number 19 must be placed in the box on the left, and the number 67 must be placed in the box on the right.</p> <p>Directions: Click and drag each selected number to the correct box.</p> <p>The lengths of two sides of a triangle are 24 inches and 43 inches. What is the range of possible lengths, in inches, for the third side, x, of this triangle?</p> <p><input type="text" value="19"/> < x < <input type="text" value="67"/></p> <p><input type="text" value="9"/> <input type="text" value="20"/> <input type="text" value="24"/> <input type="text" value="30"/> <input type="text" value="33.5"/> <input type="text" value="101.5"/></p>	002	Triangles
22	MC	D	002	Triangles
23	MC	A	002	Triangles
24	MC	B	002	Triangles
25	MC	C	002	Triangles
26	MC	A	002	Triangles

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description												
27	TEI	<p>“Reflexive Property” must be placed in the second row, second column of the table; “Side-Side-Side (SSS) Theorem” must be placed in the third row, second column of the table.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Directions: Click and drag each selected reason to the correct box.</p> <p>Given: Figure $ABCD$ with diagonal \overline{AC} $\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$</p>  <p>Complete the proof of $\triangle ABC \cong \triangle CDA$ by selecting the reasons for the last two statements.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Statements</th> <th style="width: 50%;">Reasons</th> </tr> </thead> <tbody> <tr> <td>$\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$</td> <td>Given</td> </tr> <tr> <td>$\overline{AC} \cong \overline{AC}$</td> <td>Reflexive property</td> </tr> <tr> <td>$\triangle ABC \cong \triangle CDA$</td> <td>Side-Side-Side (SSS) Theorem</td> </tr> </tbody> </table> <div style="margin-top: 10px;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 100%;">Definition of congruent triangles</th> </tr> </thead> <tbody> <tr> <td>Side-Angle-Side (SAS) Theorem</td> </tr> <tr> <td>Hypotenuse-Leg (HL) Theorem</td> </tr> <tr> <td>Given</td> </tr> </tbody> </table> </div> </div>	Statements	Reasons	$\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$	Given	$\overline{AC} \cong \overline{AC}$	Reflexive property	$\triangle ABC \cong \triangle CDA$	Side-Side-Side (SSS) Theorem	Definition of congruent triangles	Side-Angle-Side (SAS) Theorem	Hypotenuse-Leg (HL) Theorem	Given	002	Triangles
Statements	Reasons															
$\overline{AB} \cong \overline{DC}$; $\overline{BC} \cong \overline{AD}$	Given															
$\overline{AC} \cong \overline{AC}$	Reflexive property															
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Hypotenuse-Leg (HL) Theorem																
Given																
28	MC	D	002	Triangles												
29	MC	C	002	Triangles												
30	MC	D	002	Triangles												
31	MC	C	002	Triangles												
32	MC	D	002	Triangles												

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
33	TEI	Typed response: 9 (and all equivalent answers) <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Directions: Type your answer in the box.</p> <p>Given: Parallelogram $QRST$ where $QR = 6x - 5$ and $RS = 4x + 13$</p>  <p>What value of x proves this parallelogram is a rhombus?</p> <p>$x =$ <input style="width: 50px;" type="text" value="9"/></p> </div>	003	Polygons, Circles, and Three-Dimensional Figures
34	MC	B	003	Polygons, Circles, and Three-Dimensional Figures
35	MC	C	003	Polygons, Circles, and Three-Dimensional Figures
36	MC	D	003	Polygons, Circles, and Three-Dimensional Figures
37	MC	A	003	Polygons, Circles, and Three-Dimensional Figures
38	MC	D	003	Polygons, Circles, and Three-Dimensional Figures
39	MC	B	003	Polygons, Circles, and Three-Dimensional Figures
40	MC	A	003	Polygons, Circles, and Three-Dimensional Figures
41	MC	B	003	Polygons, Circles, and Three-Dimensional Figures
42	MC	C	003	Polygons, Circles, and Three-Dimensional Figures
43	MC	B	003	Polygons, Circles, and Three-Dimensional Figures
44	MC	A	003	Polygons, Circles, and Three-Dimensional Figures

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
45	MC	B	003	Polygons, Circles, and Three-Dimensional Figures
46	TEI	<p>The numbers 27 and 125 should be placed in the boxes. The order of the numbers in the boxes does not matter, since this question did not specifically state the order in which the volumes of the two spheres should be compared.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Directions: Click and drag each selected number to the correct box.</p> <p>The ratio of the lengths of the radii of two spheres is 3:5. What is the ratio of the volumes of these two spheres?</p> <div style="text-align: center;"> <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">27</div> : <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">125</div> </div> <div style="text-align: center; margin-top: 5px;"> 1 3 5 9 15 25 </div> </div>	003	Polygons, Circles, and Three-Dimensional Figures
47	MC	A	003	Polygons, Circles, and Three-Dimensional Figures

Sequence Number	Item Type: Multiple Choice (MC) or Technology-Enhanced Item (TEI)	Correct Answer	Reporting Category	Reporting Category Description
48	TEI	<p>The point $(-4,5)$ must be plotted on the coordinate plane.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Directions: Click on the grid to plot the point you want to select.</p> <p>Plot the center of the circle defined by the equation $(x + 4)^2 + (y - 5)^2 = 3^2$.</p>  </div>	003	Polygons, Circles, and Three-Dimensional Figures
49	MC	C	003	Polygons, Circles, and Three-Dimensional Figures
50	MC	A	003	Polygons, Circles, and Three-Dimensional Figures

**Spring 2014 Released
Geometry Standards of Learning Test
Total Raw Score to Scaled Score Conversion Table**

Total Raw Score If you get this many items correct:	Total Scaled Score Then your converted scaled score is:
0	0
1	223
2	254
3	273
4	287
5	298
6	308
7	316
8	323
9	330
10	336
11	341
12	347
13	352
14	357
15	361
16	366
17	370
18	374
19	378
20	382
21	386
22	390
23	394
24	398
25	402
26	406
27	410
28	414
29	417
30	421
31	425
32	430
33	434
34	438
35	443
36	447
37	452
38	457
39	462
40	468
41	474
42	480
43	487
44	495
45	505
46	516
47	529
48	548
49	579
50	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.

