

VIRGINIA STANDARDS OF LEARNING

Spring 2009 Released Test

END OF COURSE GEOMETRY

Form M0119, CORE 1

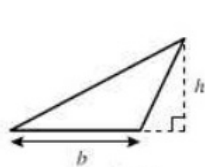
This released test contains 1 fewer test item (#1-44 only)
than an original SOL EOC Geometry test.

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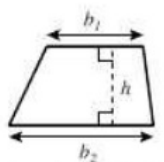
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Geometry Formula Sheet

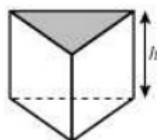
Geometric Formulas



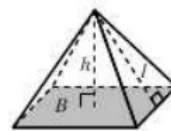
$$A = \frac{1}{2}bh$$



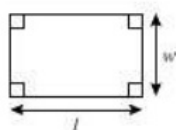
$$A = \frac{1}{2}h(b_1 + b_2)$$



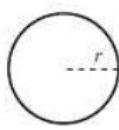
$$\begin{aligned} V &= Bh \\ L.A. &= hp \\ S.A. &= L.A. + 2B \end{aligned}$$



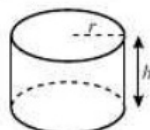
$$\begin{aligned} V &= \frac{1}{3}Bh \\ L.A. &= \frac{1}{2}lp \\ S.A. &= L.A. + B \end{aligned}$$



$$\begin{aligned} A &= lw \\ p &= 2(l + w) \end{aligned}$$



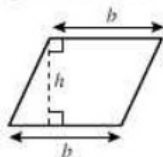
$$\begin{aligned} A &= \pi r^2 \\ C &= 2\pi r \end{aligned}$$



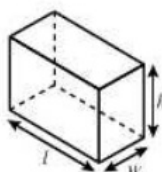
$$\begin{aligned} V &= \pi r^2 h \\ L.A. &= 2\pi r h \\ S.A. &= 2\pi r(h + r) \end{aligned}$$



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



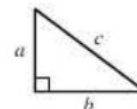
$$A = bh$$



$$\begin{aligned} V &= lwh \\ S.A. &= 2lw + 2lh + 2wh \end{aligned}$$



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



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

Geometric Symbols

Example	Meaning	Example	Meaning
$\angle A$	angle A	\vec{AB}	vector AB
$m\angle A$	measure of angle A	\perp	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.
\leftrightarrow_{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

$$\pi \approx 3.14$$

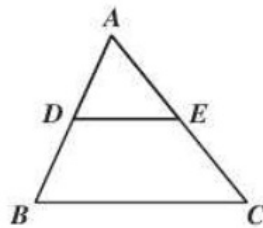
$$\pi \approx \frac{22}{7}$$

Geometry

Directions

Read each question and choose the best answer.

SAMPLE

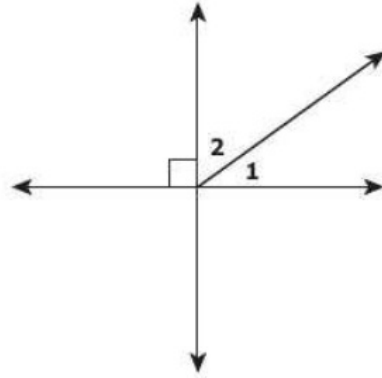


If $\triangle ABC$ is similar to $\triangle ADE$, then $AB : AD = ? : AE$. Which replaces the "?" to make the statement true?

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

1 In the figure shown, $m\angle 1 = (4x + 12)^\circ$ and $m\angle 2 = (6x + 8)^\circ$.

$$\begin{aligned}\angle 1 &= 4 \cdot 7 + 12 \\ &= 28 + 12 \\ &= 40\end{aligned}$$



What is $m\angle 1$?

- A 20°
- B 40°
- C 50°
- D 76°

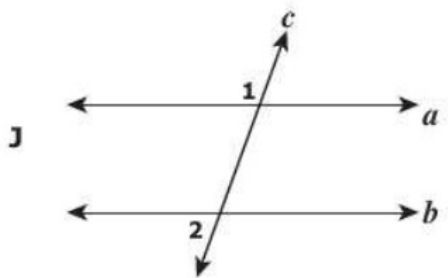
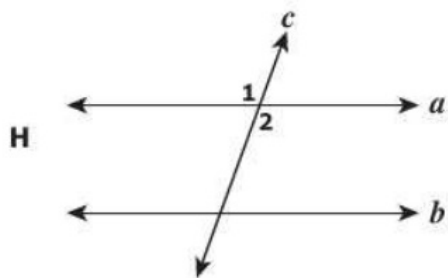
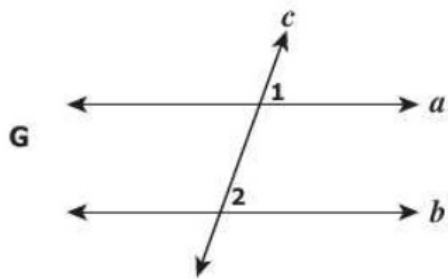
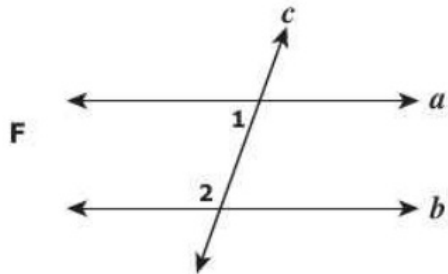
$$4x + 12 + 6x + 8 = 90$$

$$\begin{array}{r} 10x + 20 = 90 \\ - 20 \quad - 20 \\ \hline \end{array}$$

$$10x = 70$$

$$x = 7$$

- 2 In each of the following figures, transversal c cuts lines a and b . In which figure are $\angle 1$ and $\angle 2$ corresponding angles?



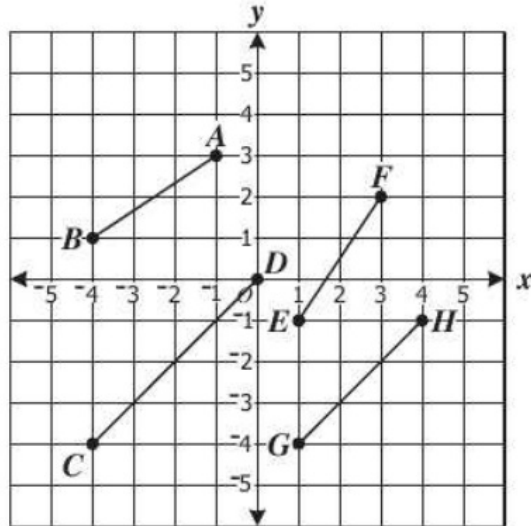
3 The arcs for a compass and straightedge construction are shown below.



Which construction is apparently being made?

- A Two lines parallel to \overline{MN}
- B Two congruent angles
- C A segment congruent to \overline{MN}
- D The perpendicular bisector of \overline{MN}

4







Which two segments in the drawing above are most likely parallel?

- F \overline{CD} and \overline{GH}
- G \overline{CD} and \overline{AB}
- H \overline{AB} and \overline{EF}
- J \overline{EF} and \overline{GH}

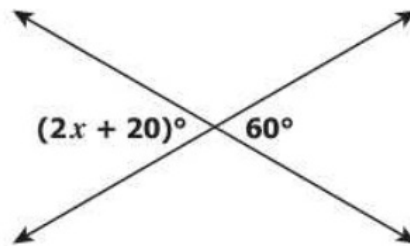
5



Which segment has a measure equal to $\frac{1}{2}(PQ)$?

- A 
- B 
- C 
- D 

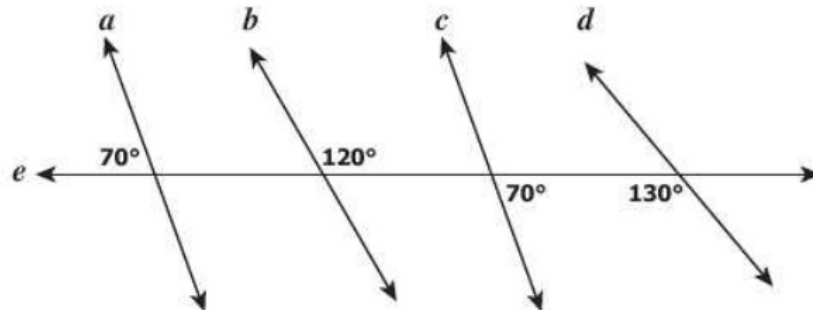
6 Two lines intersect as shown.



What is the value of x ?

- F 20
- G 40
- H 50
- J 60

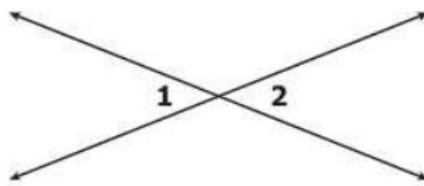
7 In this figure, transversal e intersects lines a , b , c , and d .



Which lines *must* be parallel?

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

8 In the diagram, $m\angle 1 = (6x + 12)^\circ$ and $m\angle 2 = (9x - 4)^\circ$.



Which is closest to the value of x ?

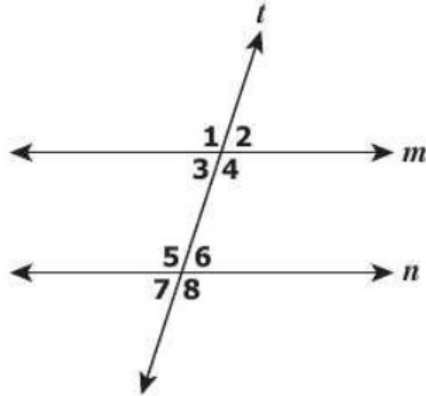
- F 5.3
- G 5.5
- H 11.5
- J 12.5

$$6x + 12 = 9x - 4$$

$$16 = 3x$$

$$x = 5.\bar{3}$$

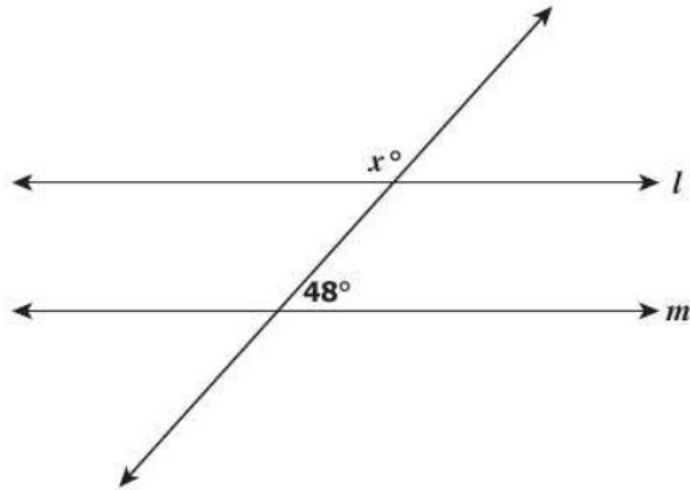
9 In this figure, line t is a transversal of lines m and n .



Which of the following statements determines that lines m and n are parallel?

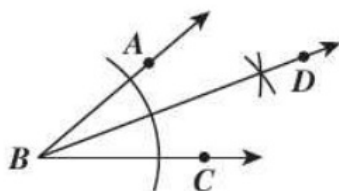
- A $\angle 1 \cong \angle 4$
- B $\angle 2 \cong \angle 7$
- C $\angle 3$ and $\angle 5$ are complementary
- D $\angle 6$ and $\angle 8$ are supplementary

10 For what value of x is line l parallel to line m in this figure?



- F 42
- G 48
- H 132
- J 138

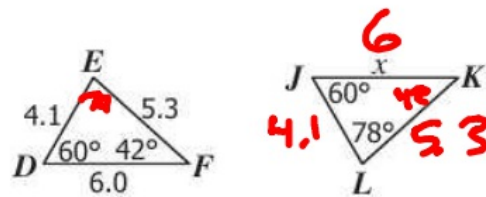
11 Amber constructed \overline{BD} as shown.



Which of the following statements *must* be true?

- A $BA = BC$
- B $BD = 2BA$
- C $m\angle ABD = m\angle CBD$
- D $m\angle CBD = 2m\angle ABC$

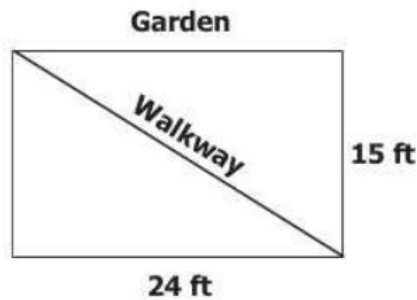
12



What value of x makes $\triangle DEF \cong \triangle JLK$?

- F $x = 9.4$
- G $x = 6.0$**
- H $x = 5.3$
- J $x = 4.1$

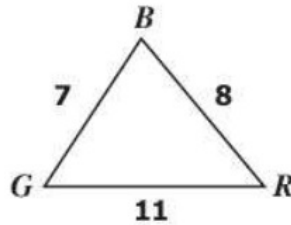
- 13 Mr. Ammons is constructing a walkway through his rectangular garden. The walkway runs diagonally as shown in the diagram.



Which is closest to the length of the walkway?

- A 18.7 ft
- B 28.3 ft
- C 30.0 ft
- D 39.0 ft

- 14 In the triangle shown, $GR = 11$, $BR = 8$, and $BG = 7$.



Which statement is true about the angles in $\triangle RGB$?

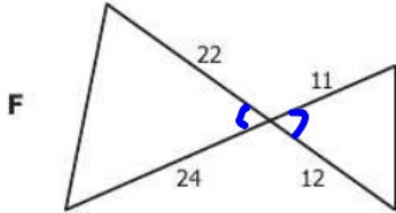
- F $m\angle R$ is the greatest
 - G $m\angle G$ is the greatest
 - H $m\angle R$ is the least
 - J $m\angle G$ is the least
- 15 Consider the following statement.

If $4x = 8$, then $x = 2$.

Which is the inverse of the statement?

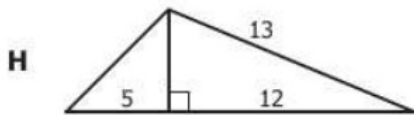
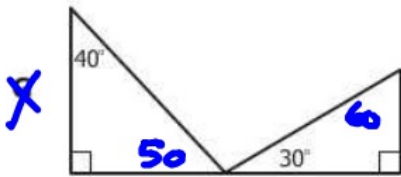
- A If $x = 2$, then $4x = 8$.
- B If $x \neq 2$, then $4x \neq 8$.
- C If $x = 2$, then $4x \neq 8$.
- D If $4x \neq 8$, then $x \neq 2$.

16 Which drawing contains a pair of similar triangles?

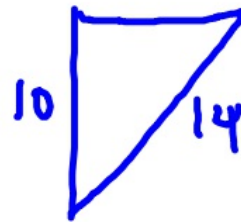
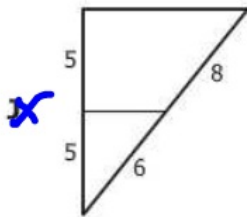


$$\frac{11}{22} = \frac{12}{24} \checkmark$$

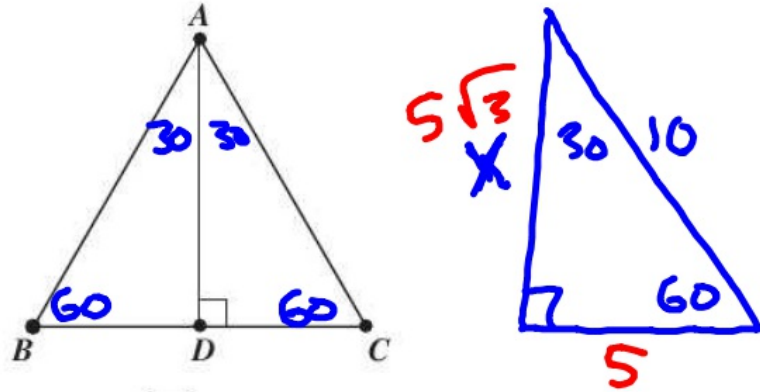
SAS



$$\frac{5}{10} = \frac{6}{14}$$

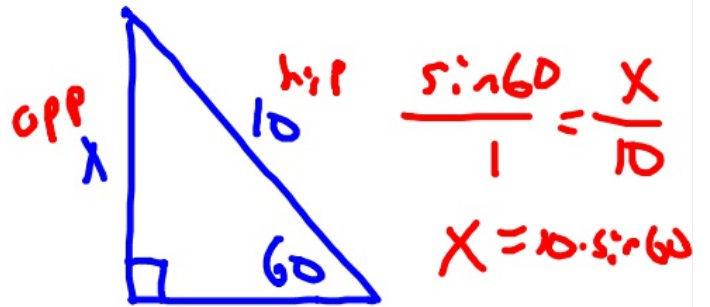


- 17 Triangle ABC is an equilateral triangle with side lengths of 10 inches.



What is the length, in inches, of \overline{AD} ?

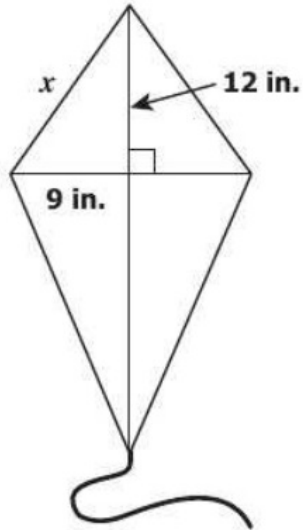
- A 5
- B $\frac{10\sqrt{3}}{3}$
- C $5\sqrt{2}$
- D $5\sqrt{3}$



- 18 John wants to make a triangular garden. Which of the following are possible dimensions?

- F 4 ft by 5 ft by 10 ft
- G 6 ft by 6 ft by 12 ft
- H 6 ft by 8 ft by 10 ft
- J 8 ft by 12 ft by 20 ft

19 A drawing of Mark's kite is shown below.

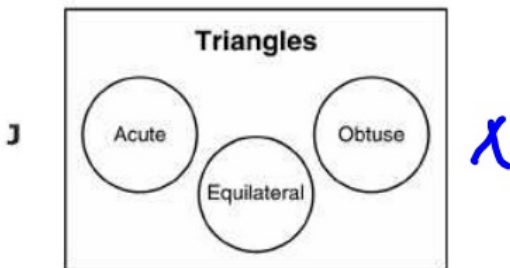
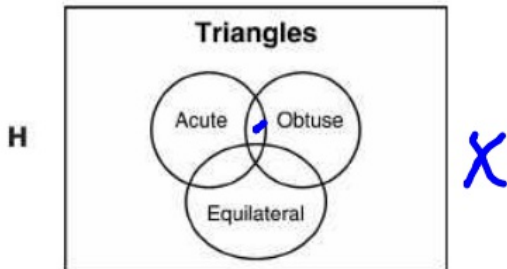
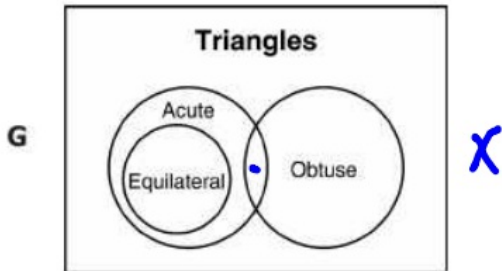
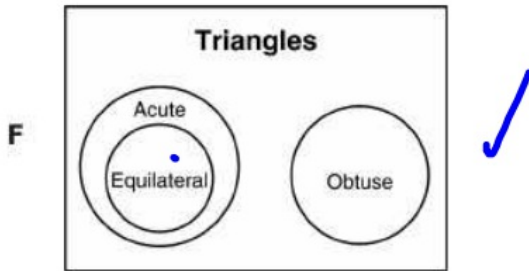


What is the length of the short section of the outer frame indicated by x in the drawing?

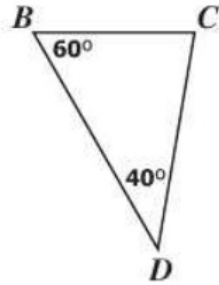
- A 16 in.
- B 15 in.
- C 14 in.
- D 13 in.

20 Which Venn diagram represents all the following set of statements?

- Some triangles are acute.
- Some triangles are obtuse.
- No triangle is both acute and obtuse.
- Some acute triangles are equilateral.



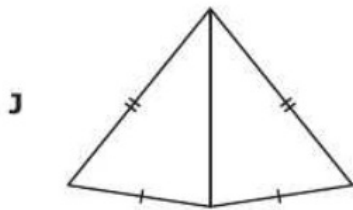
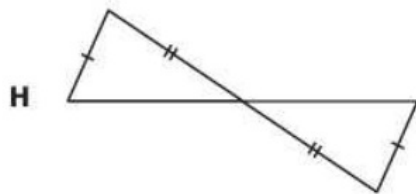
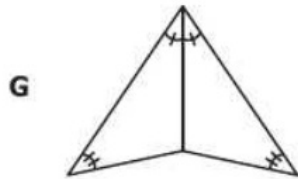
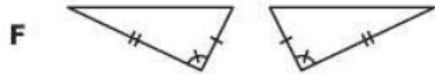
21



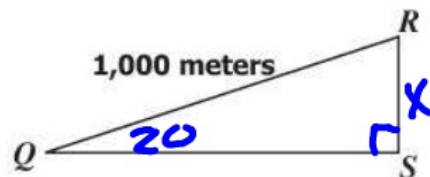
Which lists the sides of $\triangle BCD$ in order from shortest to longest?

- A $\overline{CD}, \overline{BD}, \overline{BC}$
- B $\overline{BC}, \overline{CD}, \overline{BD}$
- C $\overline{BD}, \overline{CD}, \overline{BC}$
- D $\overline{BC}, \overline{BD}, \overline{CD}$

22 With the information given in the drawings, which pair of triangles can be proven congruent by the Side-Angle-Side postulate?



- 23 Given: $\triangle QRS$ where $m\angle Q = 20^\circ$ and $m\angle S = 90^\circ$

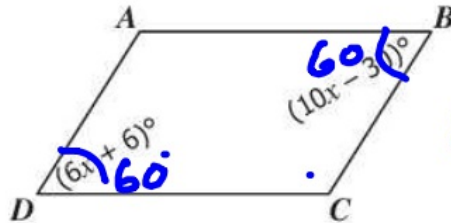


$$\frac{\sin 20}{1} = \frac{X}{1000}$$

$$X = 1000 \cdot \sin 20$$

What is the length, to the nearest meter, of \overline{RS} ?

- A 342 m
 - B 364 m
 - C ~~500 m~~
 - D ~~1000 m~~
- 24 Which of the following quadrilaterals is *not* a parallelogram?
- F Rectangle
 - G Rhombus
 - H Square
 - J Trapezoid



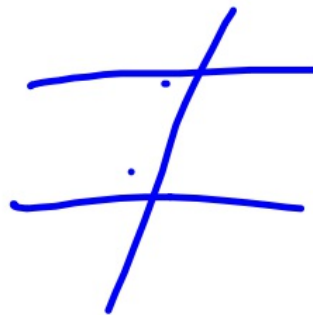
$$10x - 36 = 6x + 6$$

$$4x = 36$$

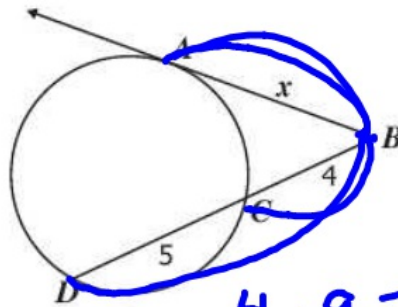
$$x = 9$$

In parallelogram $ABCD$, the measure of $\angle C$ is —

- A 82.5°
- B 97.5°
- C 120.0°**
- D 130.0°



26 In the diagram, \overline{AB} is tangent to the circle at point A , and \overline{BD} intersects the circle at points C and D .



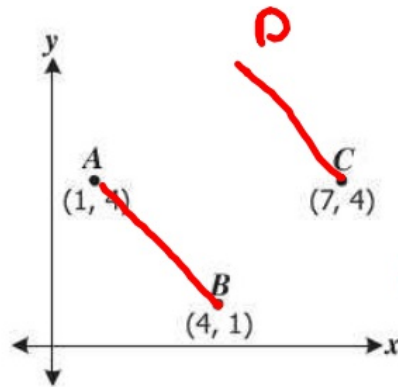
$$4 \cdot 9 = x \cdot x$$

$$36 = x^2$$

$$x = 6$$

What is the value of x ?

- F 3
- G 4
- H 5
- J 6**



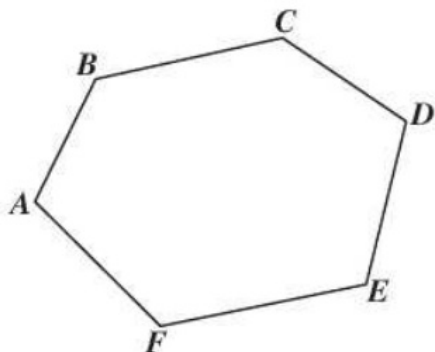
$$D = \sqrt{\Delta x^2 + \Delta y^2}$$

$$\sqrt{3^2 + 3^2}$$

$$\sqrt{18}$$

In the drawing above, what must be the coordinates of D to show $ABCD$ is a square?

- A ~~(7, 1)~~ $\sqrt{9}$
- B (4, 7) $\sqrt{10}$
- C ~~(1, 5)~~ $\sqrt{10}$
- D ~~(1, 1)~~ $\sqrt{6}$



Given the polygon shown above, $m\angle A + m\angle F + m\angle E + m\angle D + m\angle C + m\angle B =$

F 360°

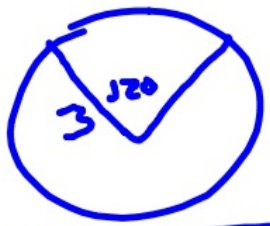
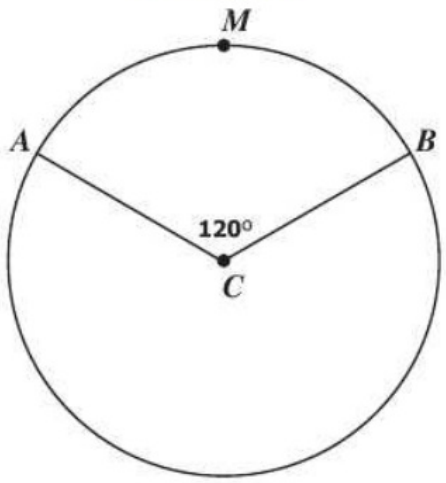
G 540°

H 720°

J 900°

$$(n-2) \cdot 180$$
$$(6-2) \cdot 180$$

29 The circumference of circle C is 144π .



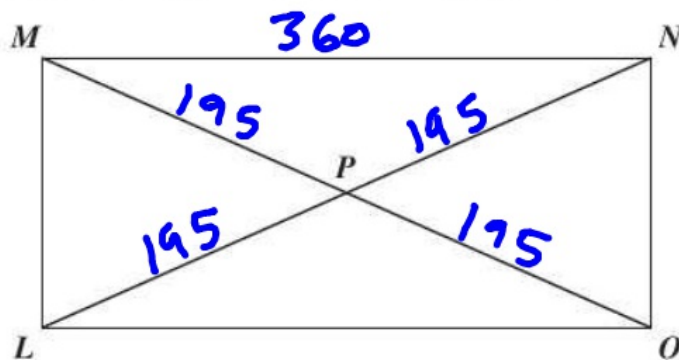
$$\frac{120}{360} \cdot 6\pi$$

$$\frac{120}{360} \cdot 144\pi$$

What is the length of \widehat{AMB} ?

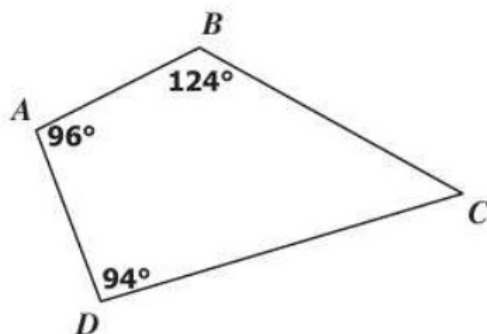
- A 8π
- B 16π
- C 48π**
- D 96π

- 30 Rectangle $LMNO$ represents a park that has walking paths \overline{LN} and \overline{MO} that intersect at P . The length of \overline{PN} is 195 feet, and the length of \overline{MN} is 360 feet. What is the length of \overline{MO} , one of the walking paths?



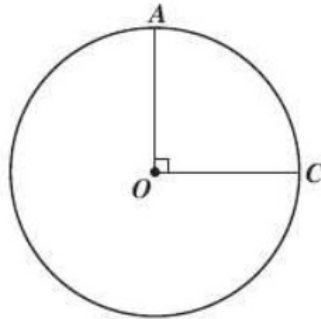
- F 150 ft
- G 195 ft
- H 360 ft
- J 390 ft

- 31 What is the measure of $\angle C$ in quadrilateral $ABCD$?



- A 46°
- B 56°
- C 86°
- D 96°

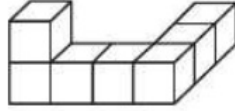
32



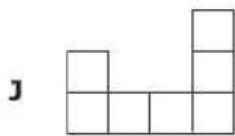
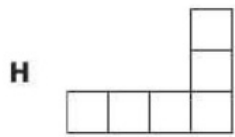
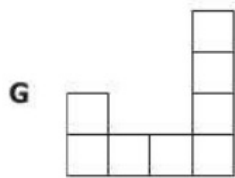
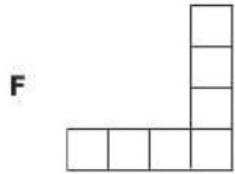
In circle O , the degree measure of \widehat{AC} is —

- F 45°
 - G 90°
 - H 135°
 - J 180°
- 33 When tiles are tessellated in a plane, what angle measure sum is required of the tiles surrounding a single point?
- A 90°
 - B 180°
 - C 360°
 - D 720°

34 This solid figure is constructed with seven cubes.



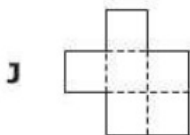
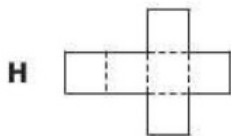
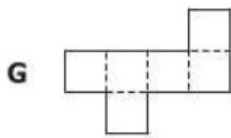
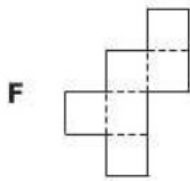
Which shape represents the top view of this three-dimensional solid?



35 Which is closest to the total surface area of a cylinder with a radius of 5 inches and a height that is equal to its diameter?

- A 314 sq in.
- B 471 sq in.
- C 596 sq in.
- D 785 sq in.

36 Which of the following nets could *not* be folded along the dotted lines to form a cube?



- 37 The radius of Sphere *A* is 2 inches, and the radius of Sphere *B* is 4 inches. How many times larger is the volume of Sphere *B* compared to the volume of Sphere *A* ?

- A 2
B 3
C 4
D 8

A

$$V = \frac{4}{3}\pi \cdot 2^3$$
$$\frac{4}{3}\pi \cdot 8$$

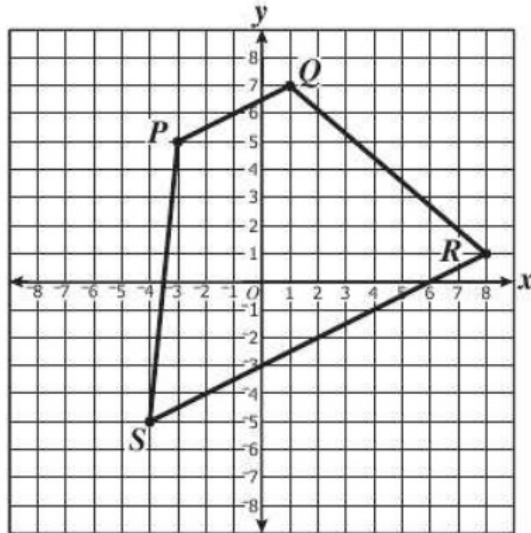
B

$$V = \frac{4}{3}\pi \cdot 4^3$$
$$\frac{4}{3}\pi \cdot 64$$

- 38 A cylinder has a diameter of 10 inches and a height four times its radius. What is its volume?

- F 500π cu in.
G $2,000\pi$ cu in.
H $4,000\pi$ cu in.
J $40,000\pi$ cu in.

- 39 $P(-3, 5)$, $Q(1, 7)$, $R(8, 1)$, and $S(-4, -5)$ are connected to form a trapezoid.

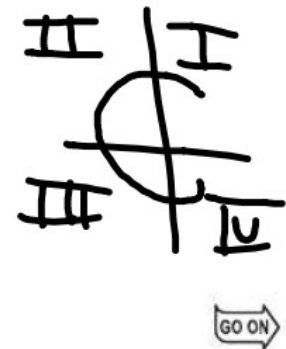
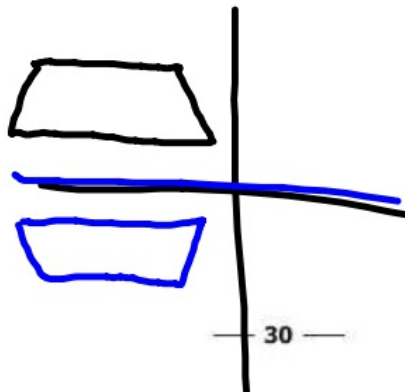


What is the midpoint of \overline{SR} ?

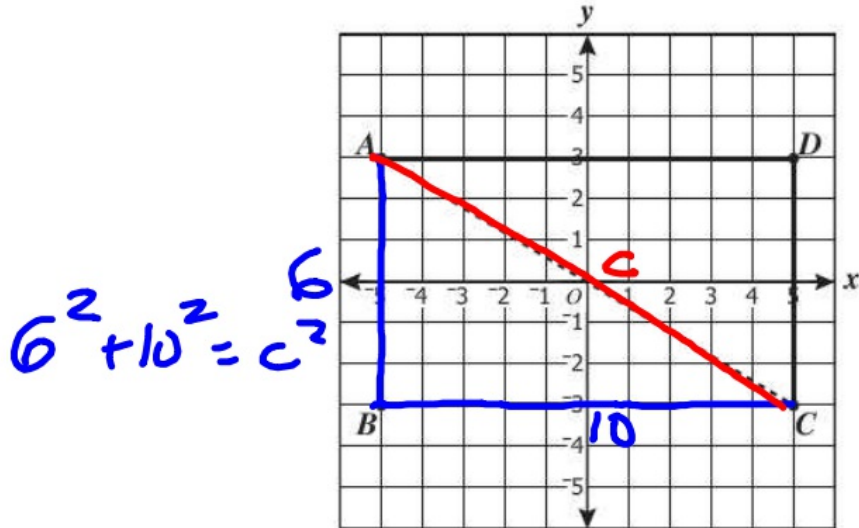
- A (0, -3)
- B (4, -1)
- C (3, -1.5)
- D (2, -2)

- 40 A trapezoid is located entirely in quadrant II. If this trapezoid is reflected across the x -axis, in which quadrant will the new trapezoid be located?

- F I
- G II
- H III
- J IV



41 Rectangle $ABCD$ is placed on a grid as shown.



Which is *closest* to the length of diagonal \overline{AC} ?

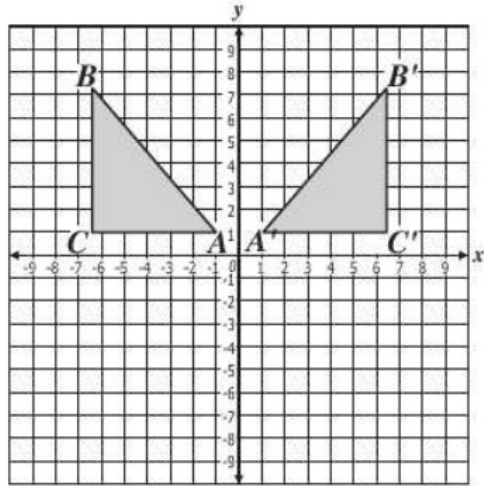
- A 8.0
- B 10.0
- C 11.3
- D 11.7

42 Which of the following letters has both line symmetry and point symmetry?

S D M H

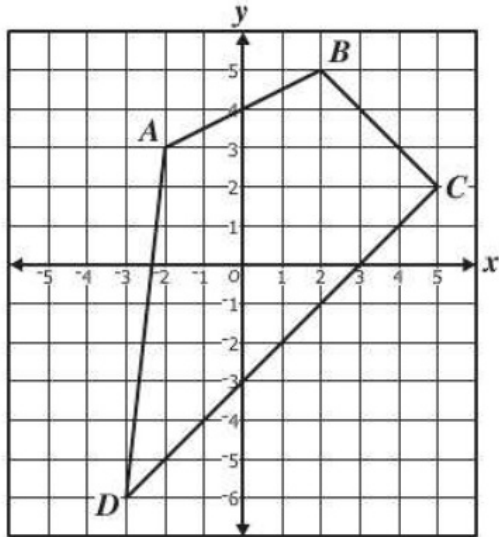
- F S
- G D
- H M
- J H

- 43 Triangle ABC was transformed into triangle $A'B'C'$. Which term most accurately describes this transformation?



- A Tessellation
- B Reflection
- C Rotation
- D Translation

44 A quadrilateral is placed on a grid as shown.



The apparent midpoint of \overline{BD} is —

- F (-0.5, -0.5)
- G (0.5, 3.5)
- H (1.5, 1.5)
- J (1.5, 2.5)

Answer Key-EOC021-M0119

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

Geometry, Core 1

If you get this many items correct:	Then your converted scale score is:
0	000
1	175
2	210
3	231
4	247
5	260
6	271
7	280
8	289
9	296
10	304
11	310
12	317
13	323
14	329
15	334
16	340
17	345
18	351
19	356
20	361
21	366
22	371
23	376
24	381
25	387
26	392
27	397
28	403
29	408
30	414
31	420
32	426
33	432
34	439
35	446
36	454
37	462
38	471
39	481
40	492
41	505
42	522
43	544
44	580
45	600

