VIRGINIA STANDARDS OF LEARNING

Spring 2006 Released Test

END OF COURSE GEOMETRY

CORE 1

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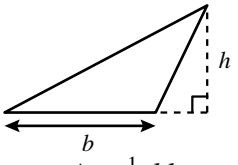
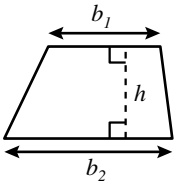
Geometry Formula Sheet

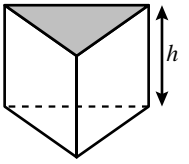
Geometric Formulas



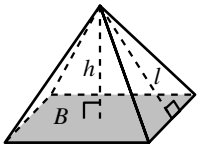
$A = \frac{1}{2}bh$



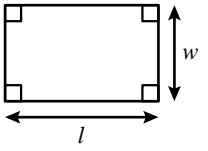
$A = \frac{1}{2}h(b_1 + b_2)$



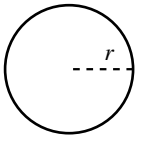
$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$



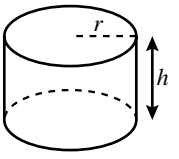
$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



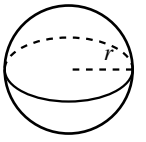
$A = lw$
$p = 2(l + w)$



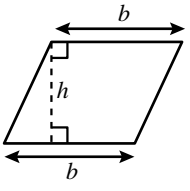
$A = \pi r^2$
$C = 2\pi r$



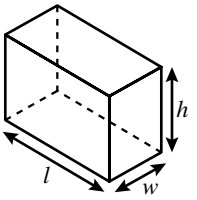
$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$



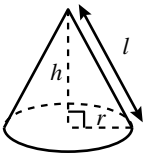
$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$



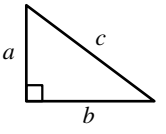
$A = bh$



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



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



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

Geometric Symbols

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

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

Abbreviations

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

Pi

$\pi \approx 3.14$

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

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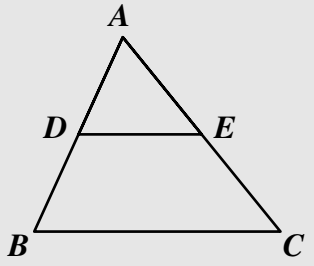
DIRECTIONS

Read and solve each question. Then mark the space on your answer document for the best answer.

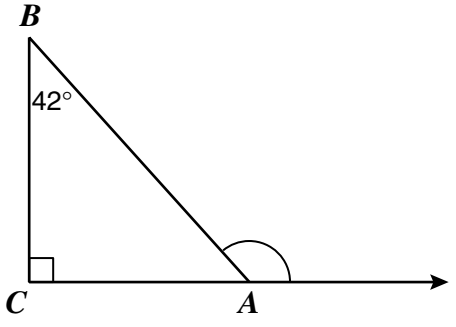
SAMPLE



If ΔABC is similar to ΔADE, then $AB : AD = ? : AE$. Which replaces the "?" to make the statement true?

A AC
B AE
C DE
D BC

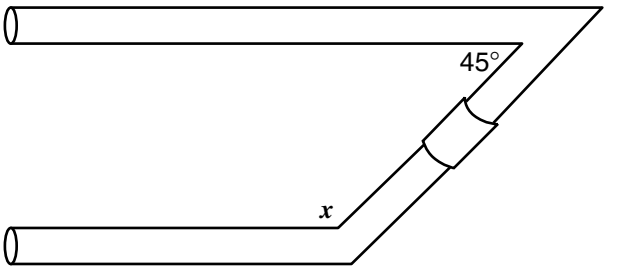
1



Which of the following is the measure of the supplement of $\angle CAB$?

A 42°
B 90°
C 132°
D 142°

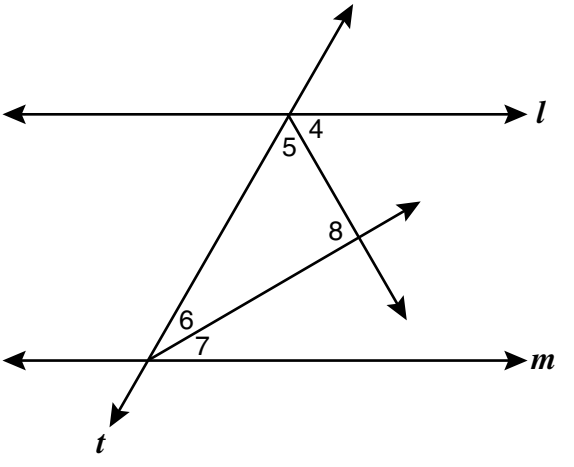
2



Two parallel sections of pipe are joined with a connecting pipe as shown. What is the value of x?

F 90°
G 115°
H 135°
J 160°

3 **Parallel lines l and m are cut by transversal t, $m\angle 4 = m\angle 5$, and $m\angle 6 = m\angle 7$.**



What is the measure of $\angle 8$?

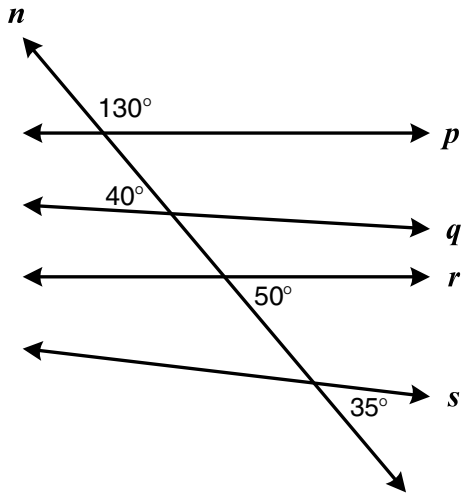
A 120°
B 90°
C 65°
D 45°

GO ON

4 What are the measures of two complementary angles if the difference of their measures is 18°?

F 36°, 54°
G 41°, 49°
H 81°, 99°
J 86°, 94°

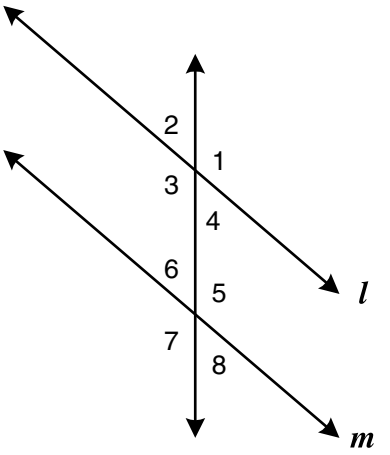
5 Line *n* intersects lines *p*, *q*, *r*, and *s*, forming the indicated angles.



Which two lines are parallel?

A p and q
B p and r
C q and r
D r and s

6

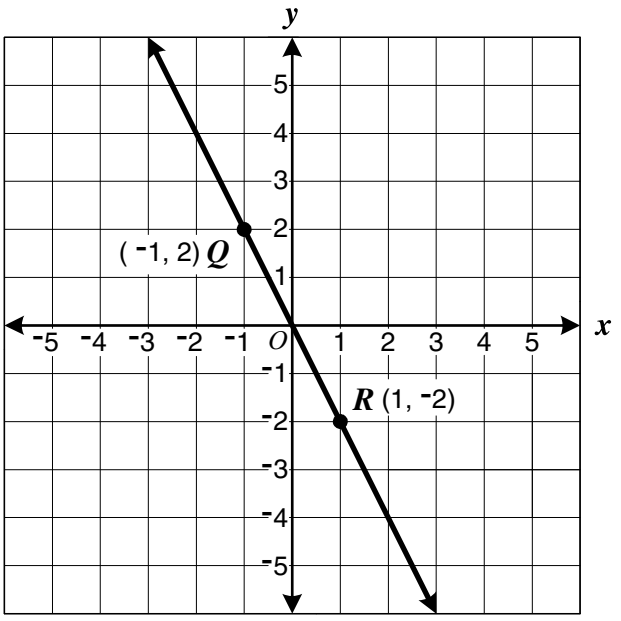


Which will prove that line *l* is parallel to line *m*?

F $\angle 2 \cong \angle 7$
G $\angle 3 \cong \angle 6$
H $\angle 5 \cong \angle 2$
J $\angle 7 \cong \angle 1$

GO ON

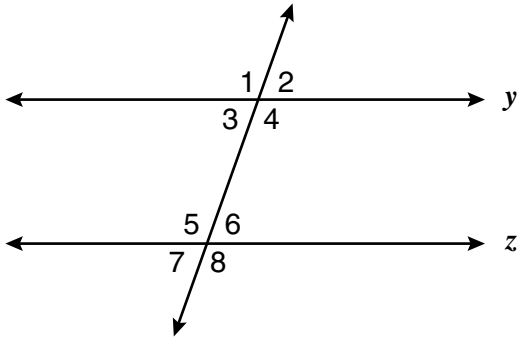
7



Which two points determine a line parallel to $\overleftrightarrow{QR}$?

A (1, 1) and (2, $^-$1)
B ($^-$1, $^-$1) and ($^-$2, $^-$3)
C (1, 4) and (5, 2)
D (2, 1) and ($^-$2, $^-$1)

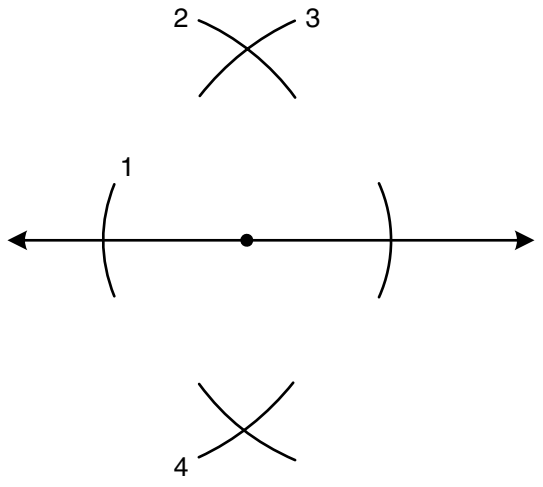
8 **Given: m∠1 = 110°**



Which must be true if $y \| z$?

F m∠8 = 100°
G m∠7 = 110°
H m∠6 = 80°
J m∠5 = 110°

9

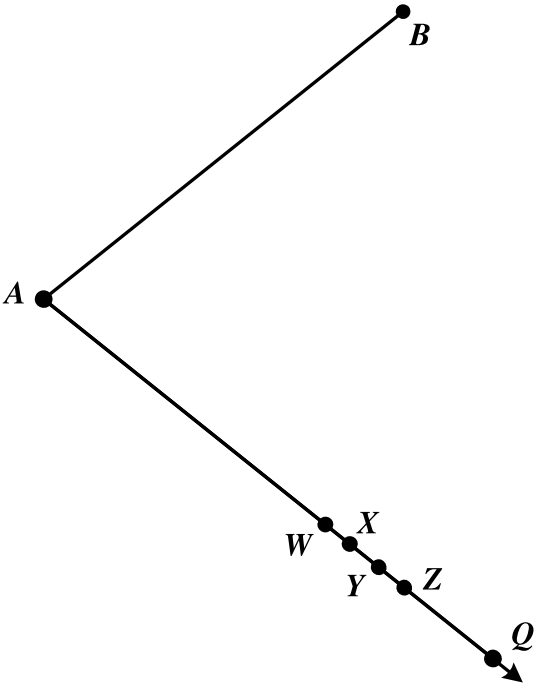


For the construction shown above, which of the following arcs must be drawn first?

A 1
B 2
C 3
D 4

GO ON

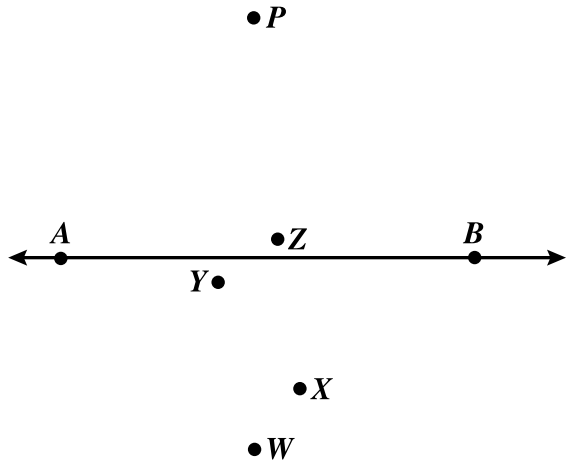
10



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

F $\overline{AW}$
G $\overline{AX}$
H $\overline{AY}$
J $\overline{AZ}$

11

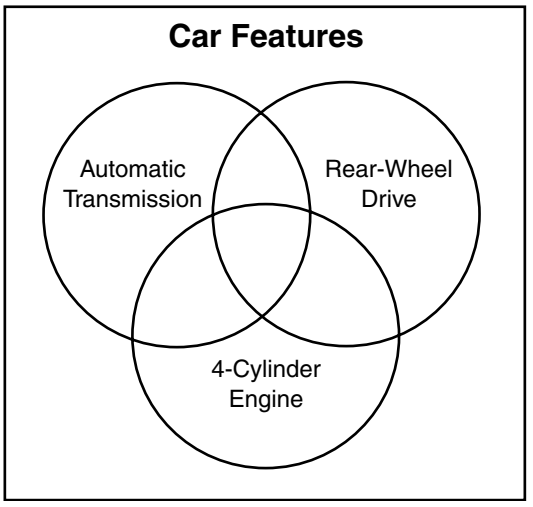


Which line is apparently perpendicular to $\overleftrightarrow{AB}$?

A $\overleftrightarrow{PW}$
B $\overleftrightarrow{PX}$
C $\overleftrightarrow{PY}$
D $\overleftrightarrow{PZ}$

GO ON

12



According to the Venn diagram above, which is true?

F All cars have automatic transmissions and rear-wheel drive.

G No cars have 4 cylinders and rear-wheel drive.

H All cars have rear-wheel drive.

J Some cars have automatic transmissions and 4 cylinders.

13 Which set of statements represents an *invalid* argument?

A If I work, then I will make money.
If I make money, then I will buy clothes.
If I work, then I will buy clothes.

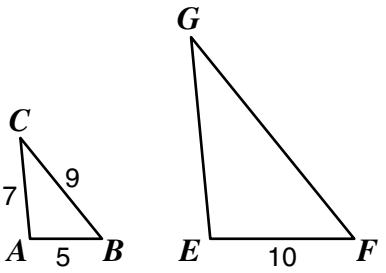
B If we pass Geometry, then we will play sports.
If we play sports, then we will get a trophy.
If we do not get a trophy, then we did not pass Geometry.

C If Mark goes camping, then he will go fishing.
If Mark goes fishing, then he will buy bait.
If Mark does not buy bait, then he will go camping.

D If it is your birthday, then you will get ice cream.
If you get ice cream, then you will get cake.
If it is your birthday, then you will get cake.

GO ON

14 Triangles *ABC* and *EFG* are similar with measurements in centimeters as shown.



What is the perimeter of triangle *EFG*?

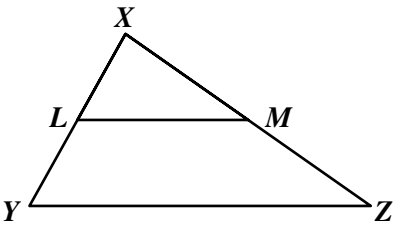
F 21 cm
G 24 cm
H 36 cm
J 42 cm

15 Which is the contrapositive of the statement below?

If you do your homework, then you will be prepared for the test.

A If you are prepared for the test, then you did your homework.
B If you are not prepared for the test, then you did not do your homework.
C If you do your homework, then you will be prepared for the test.
D If you do not do your homework, then you will not be prepared for the test.

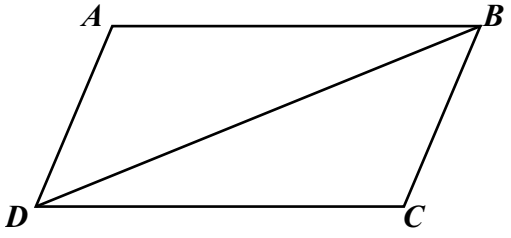
16



If triangle *XYZ* is similar to triangle *XLM*, then —

F $XM : XZ = XL : XY$
G $XM : XZ = XY : XL$
H $XL : LM = YZ : XZ$
J $XL : LY = XZ : MZ$

17 Given: *ABCD* is a parallelogram.



Prove: $\Delta ABD \cong \Delta CDB$

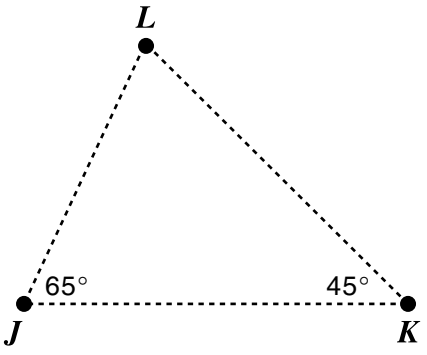
$\angle A \cong \angle C$	**Opposite angles of a parallelogram are congruent.**
$\overline{AD} \cong \overline{BC}$	**Opposite sides of a parallelogram are congruent.**
$\overline{AB} \cong \overline{CD}$	**Opposite sides of a parallelogram are congruent.**

Therefore, $\Delta ABD \cong \Delta CDB$ by which postulate/theorem?

A SSA
B ASA
C SAS
D AAS

GO ON

18 **Three boys are in a field flying kites. Viewed from above, the angle at Kyle, *K*, measures 45°, and the angle at Jake, *J*, measures 65°.**



Which shows the distances between the boys in order from least to greatest?

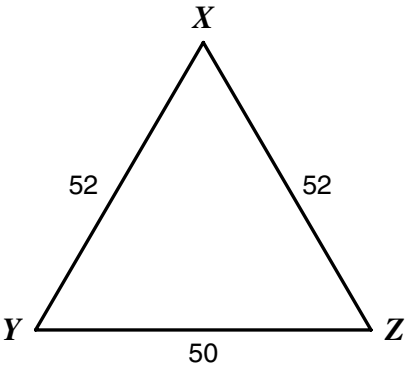
F *LJ, JK, KL*

G *KL, KJ, LJ*

H *KJ, LK, JL*

J *LJ, LK, JK*

19



Using the information in the drawing, which angle has the least measure?

A $\angle XZY$

B $\angle XYZ$

C $\angle ZXY$

D $\angle YZX$

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

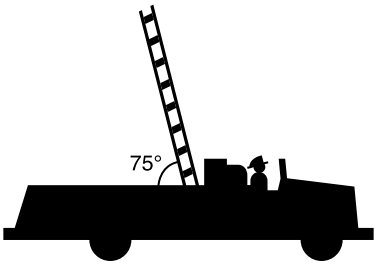
F 8 in., 19 in., 15 in.

G 6 in., 3 in., 9 in.

H 4 in., 5 in., 6 in.

J 10 in., 8 in., 9 in.

21

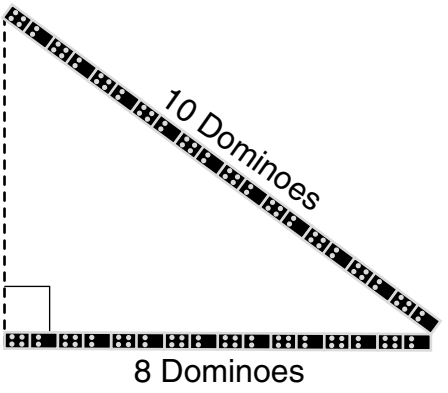


A fire truck has a ladder that can extend to 60 feet in length. The ladder can be safely raised to a maximum angle of 75° with the horizontal. Disregarding the height of the fire truck itself, which is closest to the maximum height that the ladder can safely reach?

sin 75° ≈ 0.966
cos 75° ≈ 0.259
tan 75° ≈ 3.73

A 15.53 ft
B 57.96 ft
C 60.00 ft
D 62.12 ft

22 Scotty is making a train of dominoes on the floor.



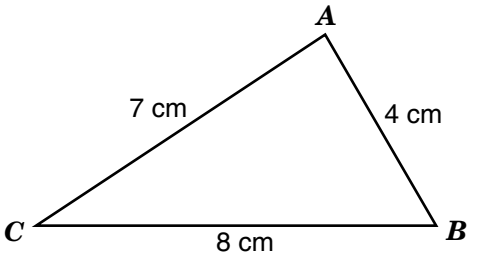
How many dominoes are needed to complete the triangle?

F 6
G 12
H 18
J 36

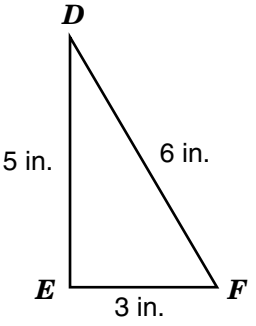
GO ON

23 Using the measures shown, which triangle must be a right triangle?

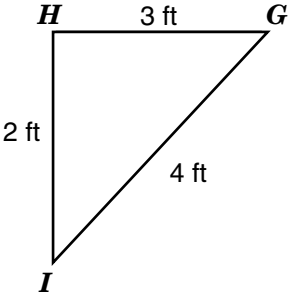
A



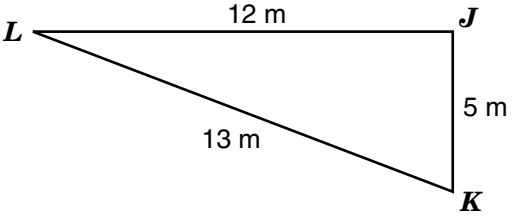
B



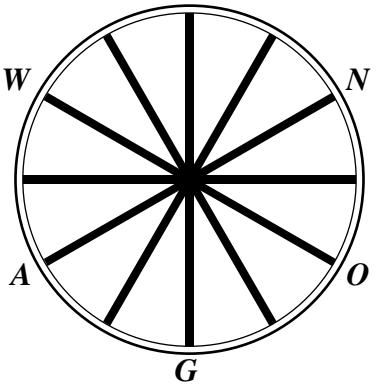
C



D



24 The spokes on a wagon wheel form twelve congruent central angles.



What is the degree measure of $\overset{\frown}{WG}$?

F 30°

G 90°

H 120°

J 150°

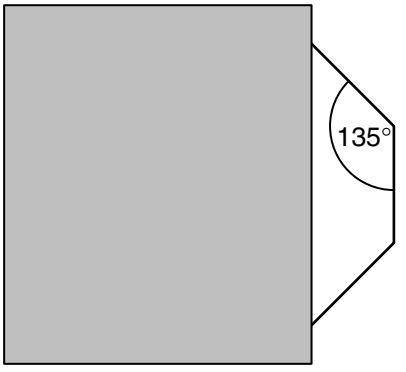
GO ON

25 ***XYZW*** **is a rectangle.**

Which of the following is *not necessarily* true?

A $XY = WZ$
B $\overline{YZ} \perp \overline{WZ}$
C $XZ = WY$
D $XY = XW$

26 **In the drawing, a *regular* polygon is partially covered by a rectangle.**

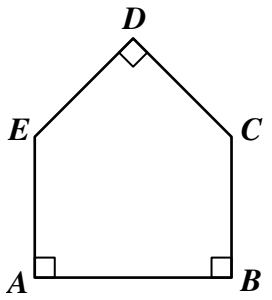


What is the number of sides of this polygon?

F 12
G 10
H 8
J 6

GO ON

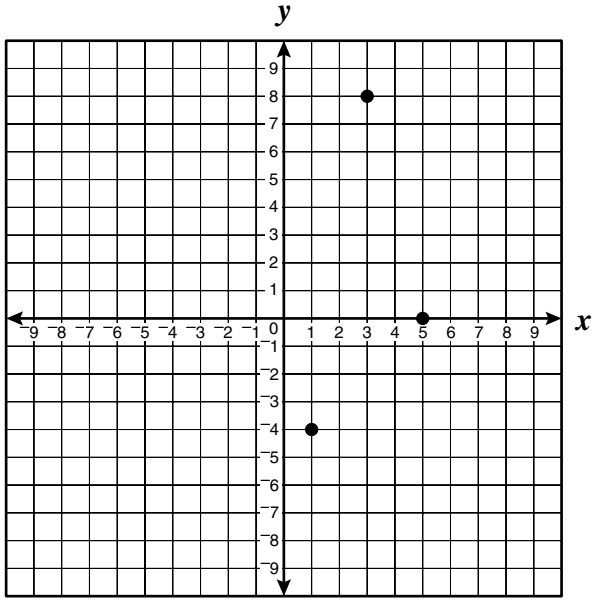
27



If $\angle E \cong \angle C$, what is m$\angle E$?

A 110°
B 120°
C 135°
D 150°

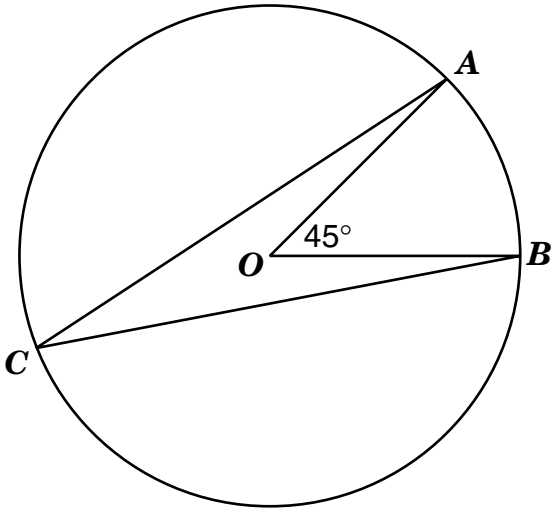
28 Three vertices of a parallelogram have coordinates (1, ⁻4), (3, 8), and (5, 0).



What are the coordinates of the second-quadrant vertex?

F (⁻3, 12)
G (⁻1, 4)
H (1, ⁻4)
J (9, 4)

29

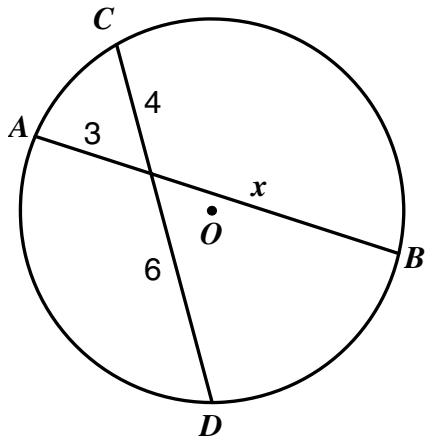


If m$\angle AOB$ = 45° in circle O, what is m$\angle ACB$?

A 22.5°
B 45°
C 67.5°
D 90°

GO ON

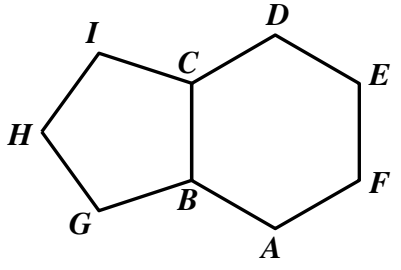
30 **Chords $\overline{AB}$ and $\overline{CD}$ intersect, forming segments with the measures shown.**



What is the value of x?

F 5
G 8
H 10
J 24

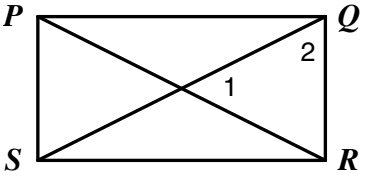
31 **A regular pentagon and a regular hexagon share a side as shown in the figure.**



What is the measure of $\angle ABG$?

A 108°
B 120°
C 132°
D 144°

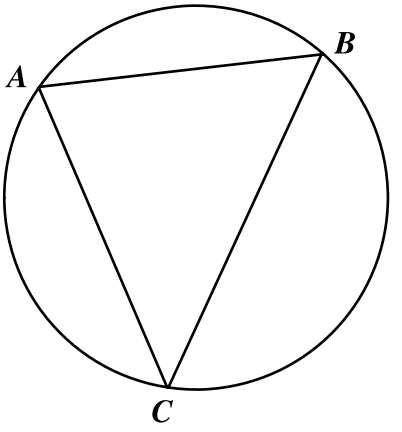
32 **In the rectangle $PQRS$, $m\angle 1 = 50°$.**



What is $m\angle 2$?

F 130°
G 85°
H 70°
J 65°

33



The sum of $m\overset{\frown}{AB}$ and $m\overset{\frown}{BC}$ is equal to —

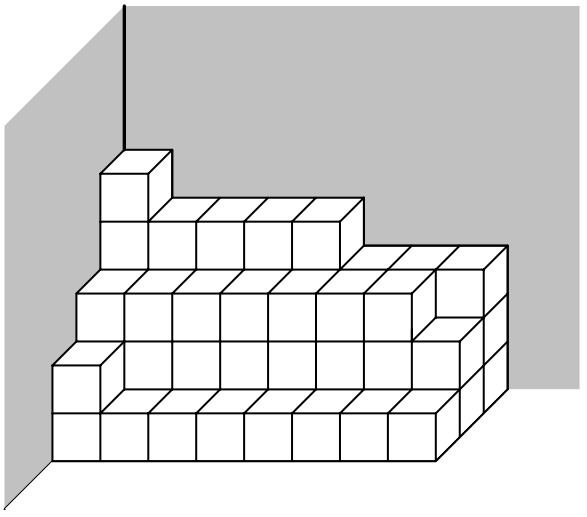
A $360° - m\overset{\frown}{AC}$
B $240° - m\overset{\frown}{AC}$
C $180° - m\overset{\frown}{AC}$
D 120°

GO ON

34 A swimming pool is being filled at the rate of 12 cubic yards per minute. If the pool is 18 yards long, 10 yards wide, and 3 yards deep, how many minutes will it take to fill the pool?

F 45 minutes
G 101 minutes
H 540 minutes
J 1,233 minutes

35 This drawing shows cubic boxes stacked in the corner of a warehouse.

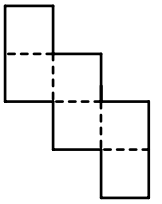


If each box will hold 8 cubic feet, what is the total capacity of the stack of boxes?

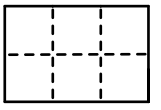
A 488 cubic feet
B 496 cubic feet
C 504 cubic feet
D 512 cubic feet

36 Which of the following nets can be folded along the dashed lines to form a cube?

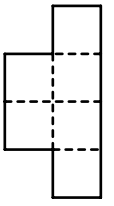
F



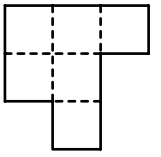
G



H



J



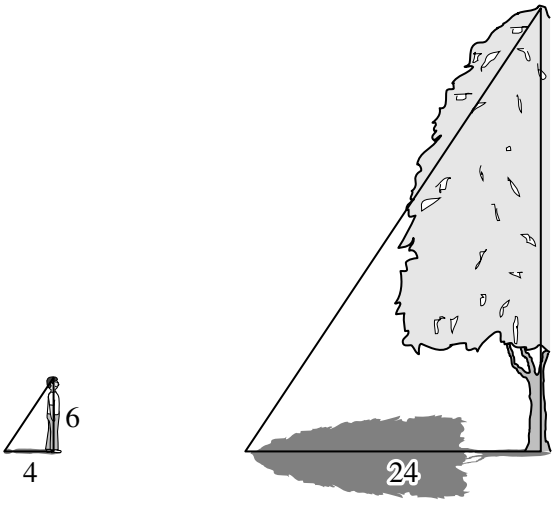
GO ON

37 **A machine for baling hay produces cylindrical bales that are 6 feet in diameter and $5\frac{1}{3}$ feet in height.**

Which is closest to the number of cubic feet in each bale of hay the machine produces?

A 100
B 151
C 301
D 603

38 **A boy knows that his height is 6 feet. At the time of day when his shadow is 4 feet, a tree's shadow is 24 feet.**

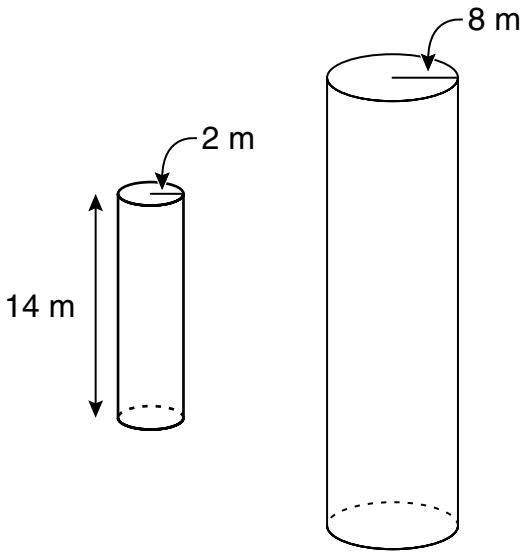


What is the height of the tree?

F 36 ft
G 24 ft
H 18 ft
J 12 ft

GO ON

39 The cylinders shown are similar.



What is the volume of the larger cylinder?

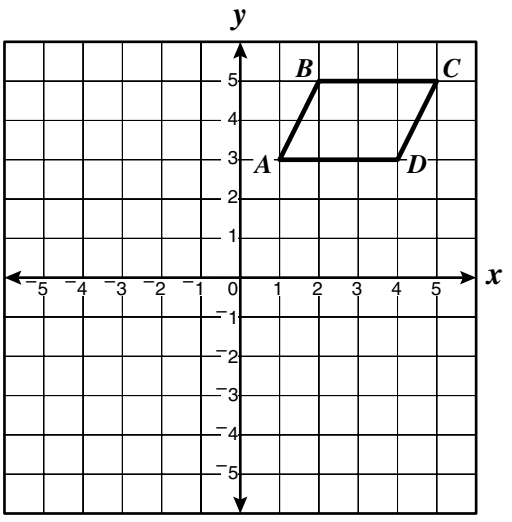
A 56π m^3

B 224π m^3

C 896π m^3

D $3{,}584\pi$ m^3

40



If parallelogram *ABCD* is translated so that the new location of point *D* is (−1, 2), what would be the new location of point *B*?

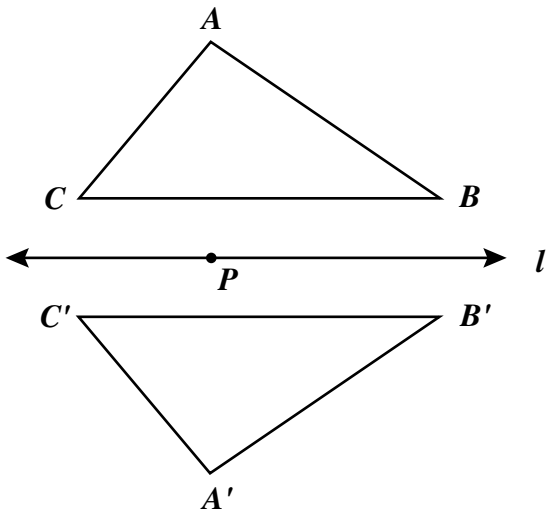
F (−5, 0)

G (−3, 4)

H (−2, 5)

J (1, 4)

41 **Triangle $A'B'C'$ is a transformation of triangle ABC.**



If $A \rightarrow A'$, $B \rightarrow B'$, and $C \rightarrow C'$, $A'B'C'$ is a —

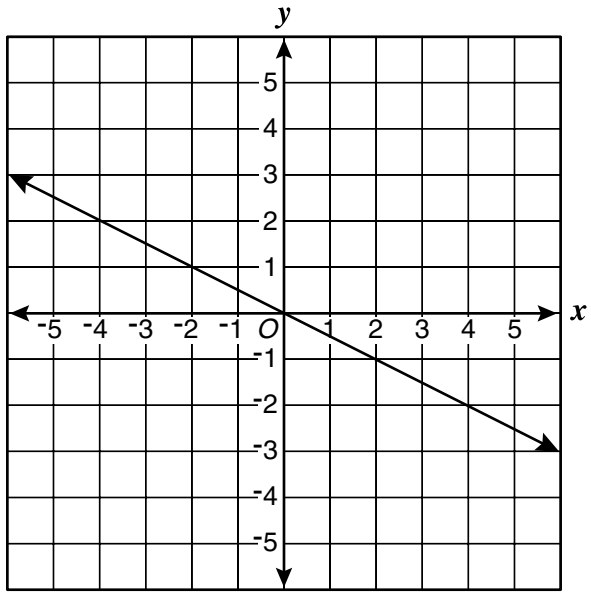
A reflection of triangle ABC across line l

B 180° rotation of triangle ABC about Point P

C translation of triangle ABC across the line l

D 90° rotation of triangle ABC across the line l

42



What is most likely the slope of the line graphed above?

F -1

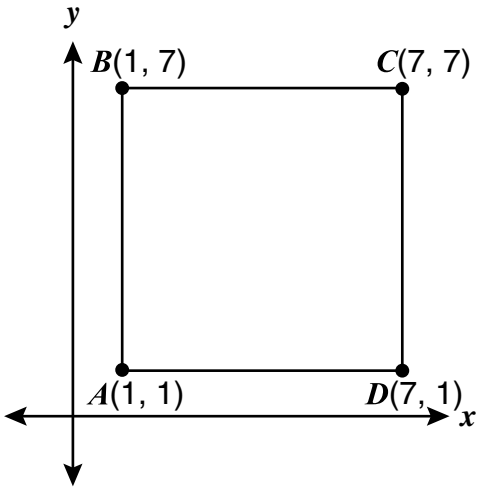
G $-\frac{1}{2}$

H $\frac{1}{2}$

J 1

GO ON

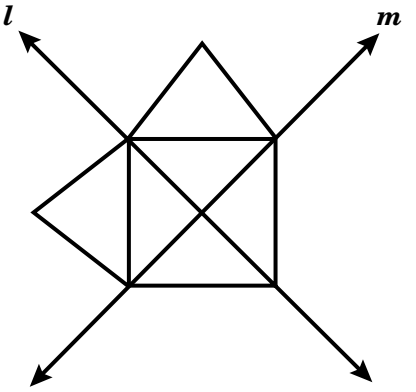
43



What is the point of intersection of $\overline{BD}$ and $\overline{AC}$?

A (3, 3)
B (3, 4)
C (4, 4)
D (4, 3)

44



The figure shown is apparently symmetric with respect to —

F line l only
G line m only
H both lines l and m
J neither line l nor line m

45 What is the midpoint of the segment joining (12, 2) and ($^-$5, $^-$7)?

A (9, 17)
B (5, $^-$3)
C (8.5, 4.5)
D (3.5, $^-$2.5)

STOP