Student Name _____

P

MCAP Maryland Comprehensive Assessment Program

Geometry

Test Book

Practice Test

TEST BOOKLET SECURITY BARCODE

Section 1
(Non-Calculator)

Directions:

Today, you will take Section 1 of the Geometry Practice Test. You will not be allowed to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the space provided will be scored.

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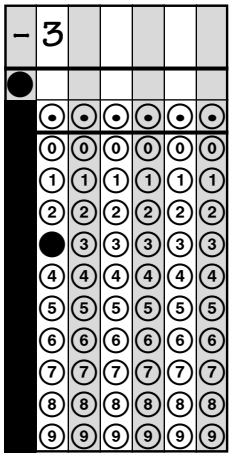
Directions for Completing the Answer Grids

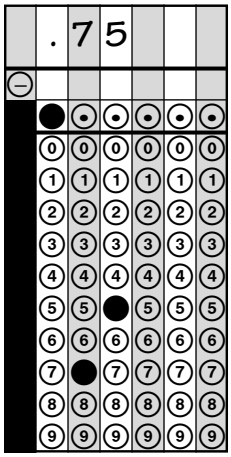
1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused box.
6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

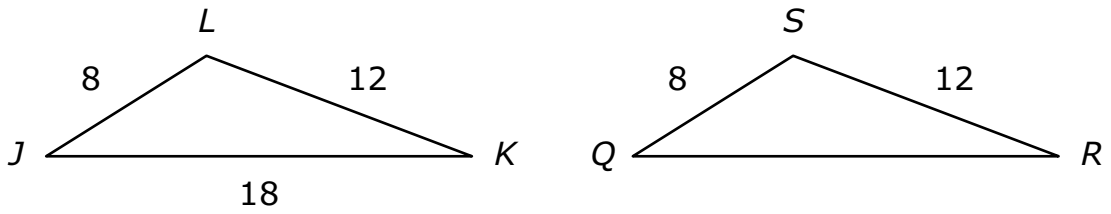
To answer −3 in a question, fill in the answer grid as shown below.



To answer .75 in a question, fill in the answer grid as shown below.



1 Given: triangles *JKL* and *QRS* with side lengths as marked



If $\angle L \cong \angle S$, which theorem can be used to prove $\triangle JKL \cong \triangle QRS$?

A the Side-Side-Side Congruence Theorem

B the Side-Angle-Side Congruence Theorem

C the Side-Side-Angle Congruence Theorem

D the Angle-Side-Angle Congruence Theorem

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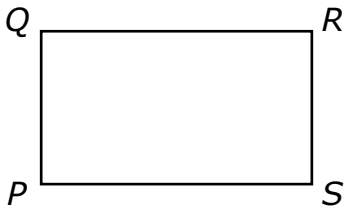
2 Given: Parallelogram $PQRS$ with $m\angle P = 90°$

Prove: Parallelogram $PQRS$ is a rectangle.



An incomplete proof is shown in the table.

Step	Statement	Reason
1	Parallelogram $PQRS$ with $m\angle P = 90°$	Given
2	$\angle P$ and $\angle Q$ are supplementary.	?
3	$m\angle P + m\angle Q = 180°$	Definition of supplementary angles
4	$90° + m\angle Q = 180°$	Substitution
5	$m\angle Q = 90°$	Subtraction Property of Equality
6	$\angle P \cong \angle R$ and $\angle Q \cong \angle S$	?
7	$m\angle P = m\angle R$ and $m\angle Q = m\angle S$	Congruent angles have the same measure.
8	$m\angle R = m\angle S = 90°$	Substitution
9	$\angle P$, $\angle Q$, $\angle R$, and $\angle S$ are right angles.	Definition of a right angle
10	$PQRS$ is a rectangle.	Definition of a rectangle

What are the reasons for Step 2 and Step 6 that can be used to complete the proof?

A Step 2: Definition of a linear pair
Step 6: Vertical angles are congruent.

B Step 2: Definition of a linear pair
Step 6: Opposite angles of a parallelogram are congruent.

C Step 2: Consecutive angles of a parallelogram are supplementary.
Step 6: Vertical angles are congruent.

D Step 2: Consecutive angles of a parallelogram are supplementary.
Step 6: Opposite angles of a parallelogram are congruent.

3 The equation shown represents a circle in the *xy*–plane.

$$(x + 4)^2 + (y - 3)^2 = 36$$

Which statement includes the correct center and the correct radius for this circle?

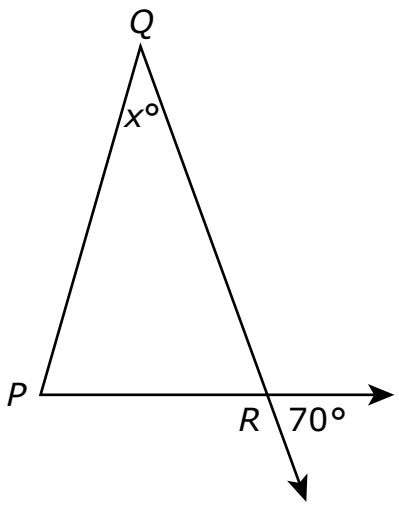
A The center is located at (4, −3), and the radius is 6.

B The center is located at (4, −3), and the radius is 36.

C The center is located at (−4, 3), and the radius is 6.

D The center is located at (−4, 3), and the radius is 36.

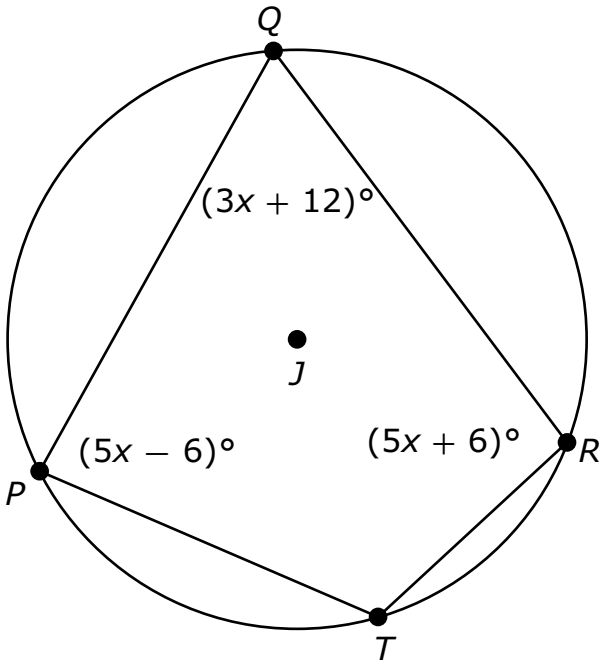
4 In the figure shown, $\overrightarrow{PR}$ and $\overrightarrow{QR}$ intersect at point R, and $\overline{QP} \cong \overline{QR}$.



What is the value of x?

Enter your answer in the space provided.

5 Quadrilateral *PQRT* is inscribed in circle *J* as shown.



What is the measure of angle *T*?

A 114°

B 120°

C 126°

D 138°

6 Three different types of transformations were performed on triangle *FGH* to result in triangle *XYZ*. Triangle *FGH* is congruent to triangle *XYZ*.

Which three types of transformations were performed on triangle *FGH* to result in triangle *XYZ*?

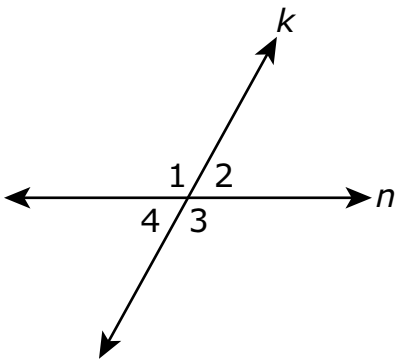
A a reflection, a rotation, and a translation

B a dilation, a translation, and a reflection

C a translation, a dilation, and a rotation

D a rotation, a reflection, and a dilation

7 Given: lines k and n intersect to form angles 1, 2, 3, and 4.



Prove: $\angle 2 \cong \angle 4$

An incomplete proof is shown.

Step	Statement	Reason
1	Lines k and n intersect to form angles 1, 2, 3, and 4.	Given
2	Angles 1 and 2 form a linear pair. Angles 1 and 4 form a linear pair.	Definition of a linear pair
3	Angles 1 and 2 are supplementary. Angles 1 and 4 are supplementary.	Angles that form a linear pair are supplementary.
4	$m\angle 1 + m\angle 2 = 180°$ $m\angle 1 + m\angle 4 = 180°$	The sum of the measures of supplementary angles is 180°.
5	$m\angle 1 + m\angle 2 = m\angle 1 + m\angle 4$	Transitive Property
6	$m\angle 2 = m\angle 4$	?
7	$\angle 2 \cong \angle 4$	Angles that have the same measure are congruent.

Which reason for step 6 correctly completes the proof?

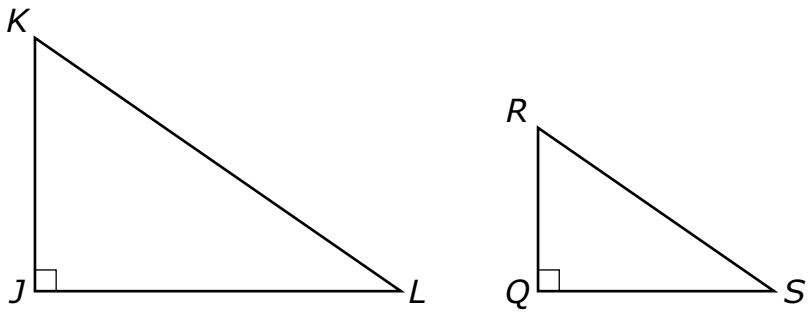
A Substitution

B Reflexive Property

C Subtraction Property of Equality

D Definition of Supplementary Angles

8 In the figure shown, $\angle K \cong \angle R$.



Which trigonometric ratio is equal to sin(L)?

A cos(Q)

B cos(R)

C sin(Q)

D sin(R)

9 Steps of a construction in a circle are described.

- Step 1: Draw a diameter of the circle and label two endpoints M and N, respectively.
- Step 2: Construct the perpendicular bisector of $\overline{MN}$.
- Step 3: Label the points of intersection of the perpendicular bisector and the circle P and Q, respectively.
- Step 4: Connect points M to P to N to Q and back to M.

Which figure is the result of this construction?

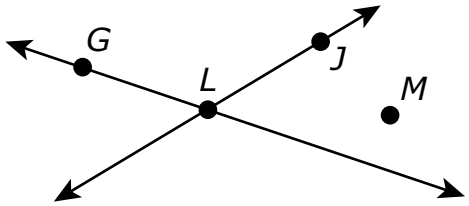
A a square inscribed in the circle

B an equilateral triangle inscribed in the circle

C a non-square rhombus inscribed in the circle

D a non-square rectangle inscribed in the circle

10 In the figure shown, $\overleftrightarrow{GL}$ and $\overleftrightarrow{JL}$ intersect at point L, and point M is not on either line.



Both lines will be dilated using a scale factor of 2 and the same center of dilation. Which point should be used as the center of dilation so that neither image results in the same line as its preimage?

A point G

B point J

C point L

D point M

11 In the xy–plane, two vertices of isosceles triangle XYZ are at $X(1, 2)$ and $Y(7, 2)$, and $XZ = YZ$.

Which ordered pair could represent the location of point Z?

A (3, 0)

B (3, 4)

C (4, 2)

D (4, 5)

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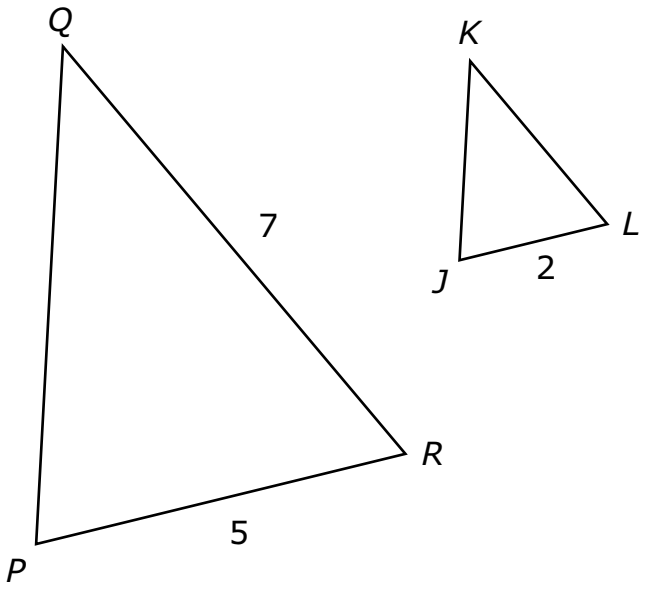
12 Given: $\angle P \cong \angle J$, $\angle Q \cong \angle K$

Prove: $KL = 2.8$



An incomplete proof is shown in the table.

Step	Statement	Reason
1	$\angle P \cong \angle J$, $\angle Q \cong \angle K$, $PR = 5$, $QR = 7$, and $JL = 2$.	Given
2	$\triangle PQR \sim \triangle JKL$	?
3	$\frac{KL}{QR} = \frac{JL}{PR}$	?
4	$\frac{KL}{7} = \frac{2}{5}$	Substitution
5	$KL = \frac{14}{5} = 2.8$	Multiplication property of equality

What are the reasons for Step 2 and Step 3 that can be used to complete the proof?

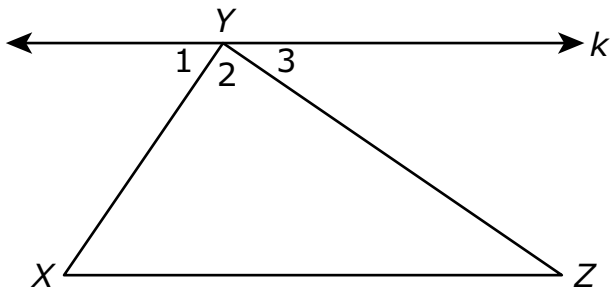
A Step 2: AA Similarity
Step 3: Corresponding sides of similar triangles are proportional.

B Step 2: AA Similarity
Step 3: The measures of corresponding angles of similar triangles are equal.

C Step 2: SAS Similarity
Step 3: Corresponding sides of similar triangles are proportional.

D Step 2: SAS Similarity
Step 3: The measures of corresponding angles of similar triangles are equal.

13 Given: $\triangle XYZ$ with point Y on line k, and $k \parallel \overline{XZ}$.



Which statement will **most likely** be used to prove that $m\angle X + m\angle XYZ + m\angle Z = 180°$?

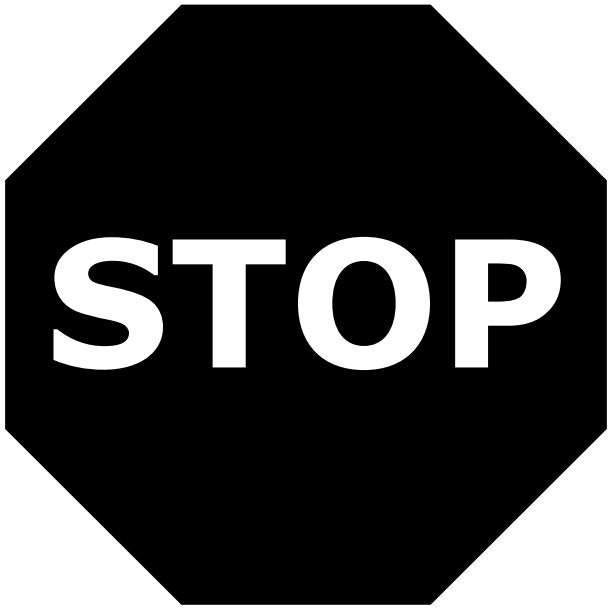
A $m\angle 2 = 90°$

B $m\angle 1 = m\angle 3$

C $m\angle 1 = m\angle X$

D $m\angle 2 + m\angle Z = 180°$

STOP



You have come to the end of Section 1 of the test. Review your answers from Section 1 only.

GO ON TO NEXT PAGE

Section 2
(Calculator)

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EXAMPLES

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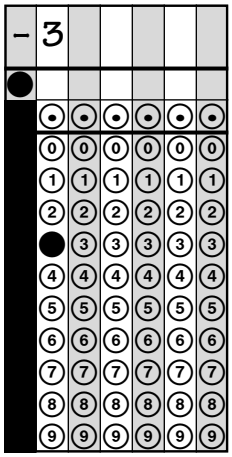

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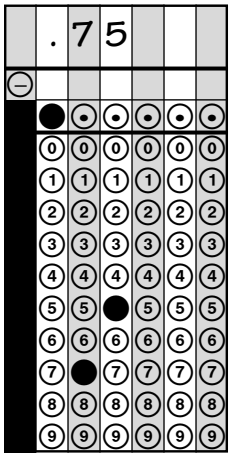


1 A bird flew from a point on the ground directly to the edge of the roof of a building. The height of the building is 40 feet, and the angle of elevation the bird's flight path made with the ground is 26°.

Which expression models the total distance, in feet, the bird flew?

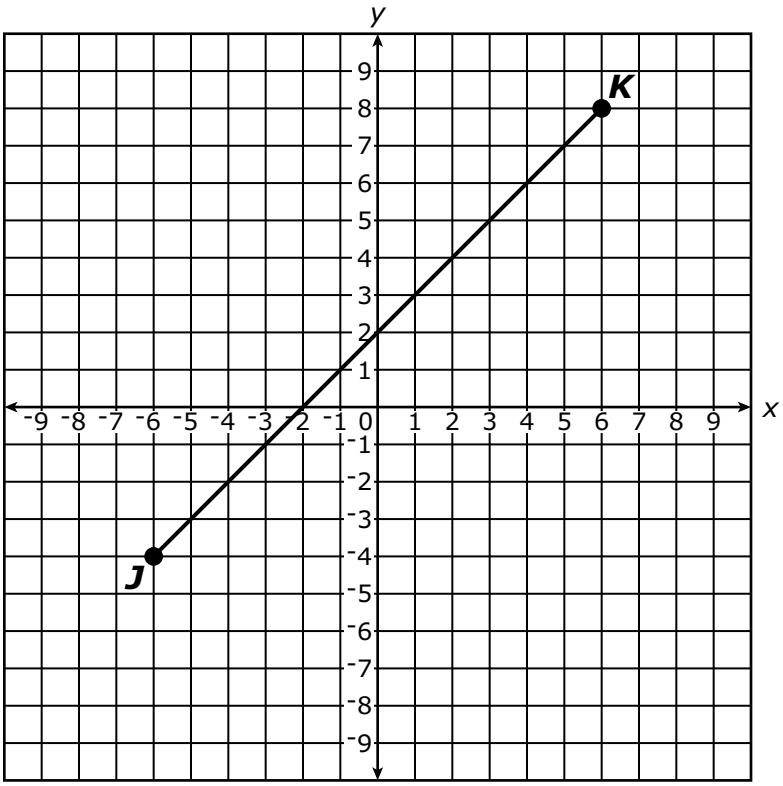
A $\frac{40}{\cos 26°}$

B $\frac{40}{\sin 26°}$

C $\frac{\cos 26°}{40}$

D $\frac{\sin 26°}{40}$

2 Segment *JK* is shown on the coordinate plane. The endpoints of the segment have integer coordinates.



Point *L* is located on segment *JK* such that the ratio of *JL* to *KL* is 1:3.

What are the coordinates of point *L*?

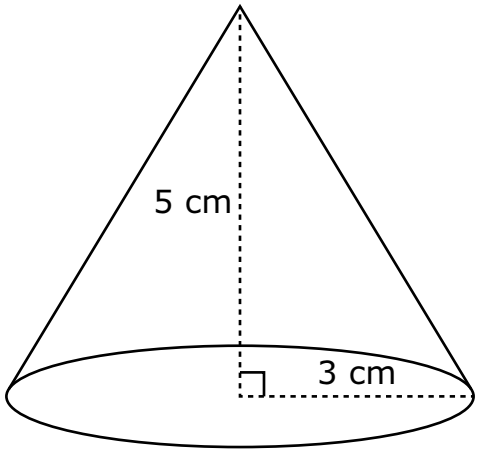
A (−5, −3)

B (−3, −1)

C (−2, 0)

D (0, 2)

3 A cone has a base radius of 3 centimeters and a height of 5 centimeters. A student correctly calculates its volume to be 15π cubic centimeters.



The student thinks that a simpler formula for the volume of a cone is $V = \pi rh$ because $\pi(3)(5) = 15\pi$.

Which statement explains the conditions for which the student's claim would be true?

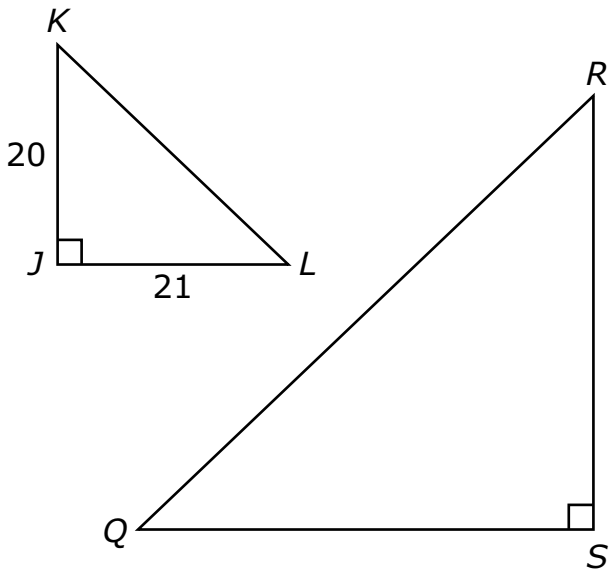
A The claim is true only when the height is 5.

B The claim is true only when the radius of the cone is 3.

C The claim is true regardless of the dimensions of the cone.

D The claim is true whenever the product of the base and height is 15.

4 In the figure, $m\angle K + m\angle Q = 90°$.



Which trigonometric ratios are equivalent?

Select **all** that apply.

A $\sin(L)$ and $\sin(Q)$

B $\sin(L)$ and $\cos(Q)$

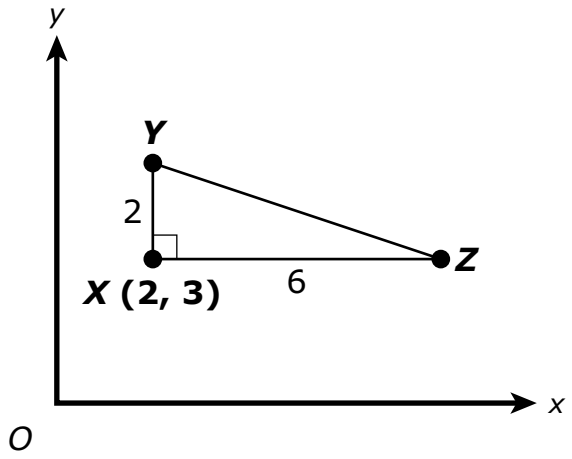
C $\sin(L)$ and $\sin(R)$

D $\cos(L)$ and $\sin(Q)$

E $\cos(L)$ and $\cos(Q)$

F $\cos(L)$ and $\sin(R)$

5 Right triangle XYZ is shown in the xy–plane. Vertex X has coordinates (2, 3). The length of $\overline{XY}$ is 2 units, and the length of $\overline{XZ}$ is 6 units.



A student's work for finding the slope of the perpendicular bisector of $\overline{YZ}$ is shown.

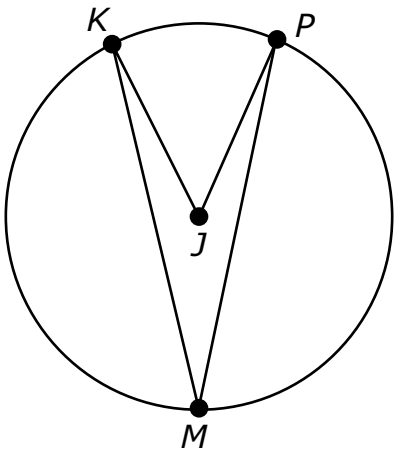
Student's Work

> The slope of $\overline{YZ}$ is $\frac{2}{6}$, or $\frac{1}{3}$. The opposite of the reciprocal of $\frac{1}{3}$ is -3. So, the perpendicular bisector of $\overline{YZ}$ has a slope of -3.

- Describe the student's mistake.
- Find the equation of the line that represents the perpendicular bisector of $\overline{YZ}$. Show your work or explain how you found the equation.

Enter your answer and your work or explanation in the space provided.

6 In the figure shown, points K, M, and P lie on circle J.



Which statement correctly compares two angle measures in the figure?

A $2(m\angle KMP) = m\angle KJP$

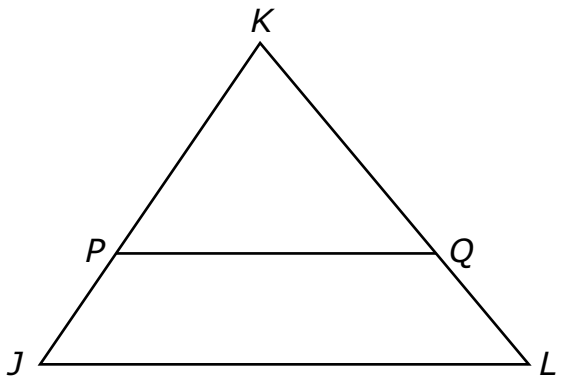
B $2(m\angle JKM) = m\angle KMP$

C $2(m\angle JPM) = m\angle KJP$

D $2(m\angle KJP) = m\angle KMP$

7 Given: $\overline{PQ} \parallel \overline{JL}$

Prove: $\frac{JP}{PK} = \frac{LQ}{QK}$



An incomplete proof is shown in the table.

Step	Statement	Reason
1	$\overline{PQ} \parallel \overline{JL}$	Given
2	$\angle KPQ \cong \angle KJL$, $\angle KQP \cong \angle KLJ$	?
3	$\triangle PKQ \sim \triangle JKL$	AA criterion
4	$\frac{JK}{PK} = \frac{LK}{QK}$	?
5	$\frac{JP + PK}{PK} = \frac{LQ + QK}{QK}$	Segment addition postulate
6	$\frac{JP}{PK} + \frac{PK}{PK} = \frac{LQ}{QK} + \frac{QK}{QK}$	Distributive property
7	$\frac{JP}{PK} = \frac{LQ}{QK}$	Addition property of equality

Which reasons for Step 2 and Step 4 complete the proof?

Select **all** that apply.

A Step 2: When two parallel lines are cut by a transversal, corresponding angles are congruent.

B Step 2: When two parallel lines are cut by a transversal, alternate interior angles are congruent.

C Step 4: Corresponding sides of similar triangles are congruent.

D Step 4: Corresponding sides of similar triangles are proportional.

E Step 4: Corresponding sides of congruent triangles are congruent.

F Step 4: Corresponding sides of congruent triangles are proportional.

8 A can is in the shape of a right circular cylinder with an inner diameter of 7.5 centimeters and an inner height of 12.5 centimeters. The can is placed on its circular base, and 450 milliliters of juice is poured into the can.

Given that 1 milliliter is equivalent to 1 cubic centimeter, what is the height of the juice in the can to the nearest tenth of a centimeter?

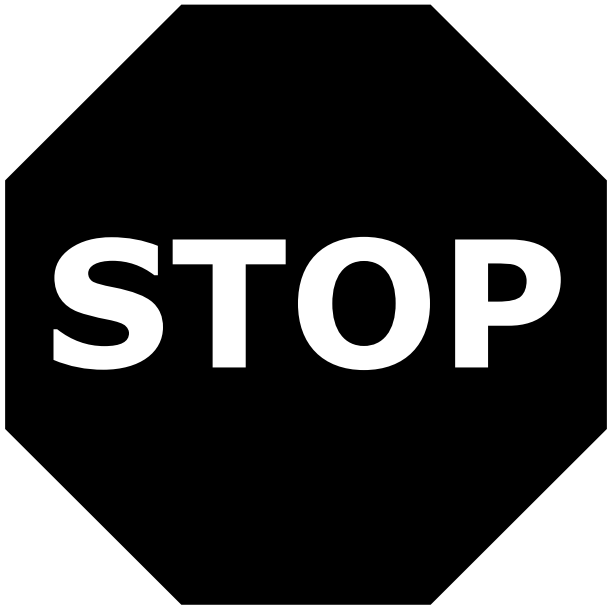
A 2.5 cm

B 8.0 cm

C 10.2 cm

D 11.3 cm

STOP



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STOP

GO ON TO NEXT PAGE

Section 3
(Calculator)

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GO ON ▶

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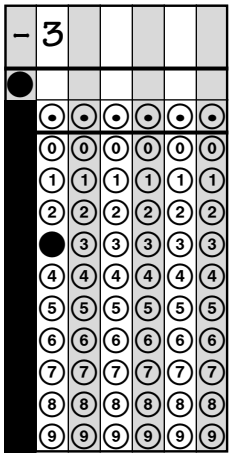

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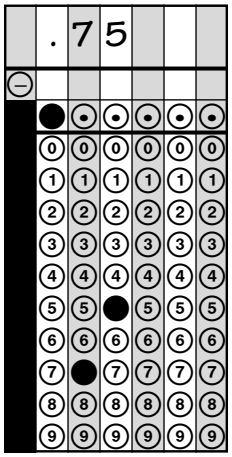


1 A student claims that any quadrilateral with congruent diagonals must be a rectangle.

Which phrase **best** describes a shape that can be used to show the student's claim is incorrect?

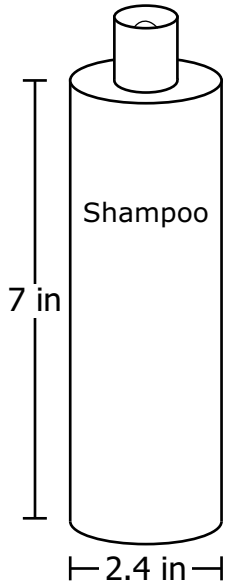
A a square

B a rhombus with no right angles

C a parallelogram with four right angles

D a trapezoid with congruent nonparallel sides

2 The figure shows the dimensions of a bottle of shampoo.



The cap at the top of the shampoo bottle can be modeled by a cylinder with a diameter of 1 inch and a height of 1 inch.

A student wants to mail 2 bottles of shampoo to a friend. The student packs the 2 bottles of shampoo in a box that is 6 inches long, 4 inches wide, and 10 inches tall. After placing the 2 bottles of shampoo in the box, the student will fill the empty space in the box with packing materials.

How much packing material, in cubic inches, will the student need to fill the empty space in the box? Show your work or explain your answer.

Enter your answer and your work or explanation in the space provided.

3 In right triangle XYZ, the length of the hypotenuse $\overline{YZ}$ is 10 inches and $\tan Z = \frac{3}{4}$.

What is the length, in inches, of the leg $\overline{XY}$?

Enter your answer in the space provided.

4 A farmer wants to build a garden using fence. A total of 60 feet of fence will be used to enclose the garden. The farmer calculates that the area of the garden will be 225 square feet if a square-shaped garden is built using the fence. The farmer also considers building the garden in different shapes to increase the area enclosed by the fence.

Building the garden in which shape will increase the area of the garden enclosed by the fence?

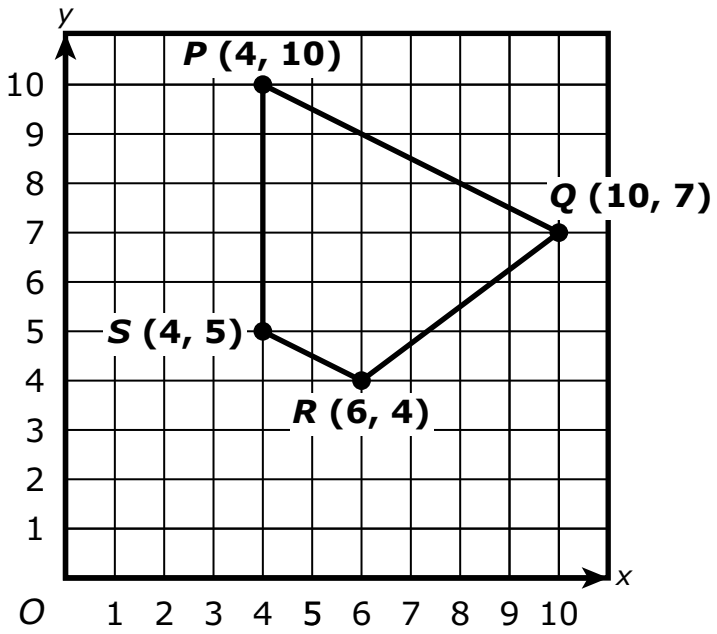
A circle

B equilateral triangle

C rhombus that is not a square

D rectangle that is not a square

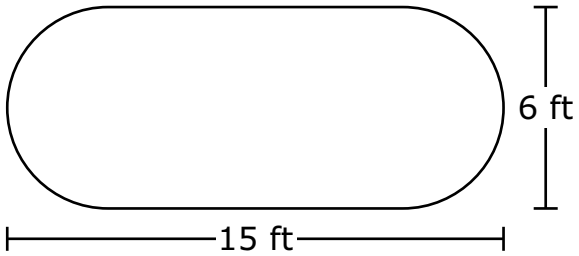
5 The coordinates of the vertices of quadrilateral *PQRS* are shown in the *xy*–plane.



- Prove that quadrilateral *PQRS* is a trapezoid.
- Determine whether quadrilateral *PQRS* is an isosceles trapezoid.
- Show your work or explain how you determined your answers.

Enter your answer and your work or explanation in the space provided.

6 A water tank is in the shape of a cylinder that has a hemisphere attached to each circular base. The diameter of the cylindrical part of the tank is 6 feet, and the total length of the tank is 15 feet as shown in the diagram.



It takes approximately 7.48 gallons of water to fill 1 cubic foot of space. Which measurement is closest to the maximum amount of water, in gallons, the tank can hold?

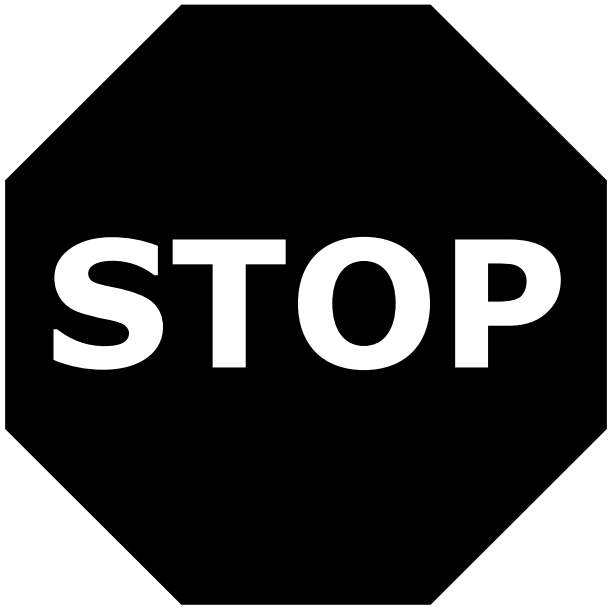
A 4018 gallons

B 3595 gallons

C 2749 gallons

D 2326 gallons

STOP



You have come to the end of Section 3 of the test. Review your answers from Section 3 only.

GO ON TO NEXT PAGE

Section 4
(Calculator)

Directions:

Today, you will take Section 4 of the Geometry Practice Test. You will be allowed to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the space provided will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

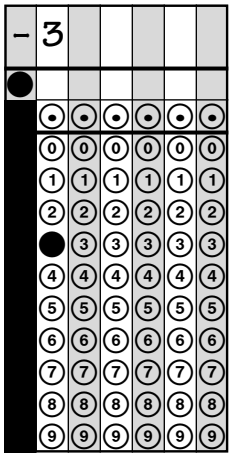
GO ON ▶

Directions for Completing the Answer Grids

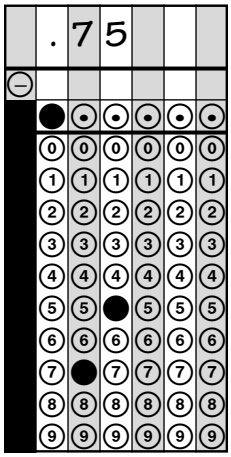
1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused box.
6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

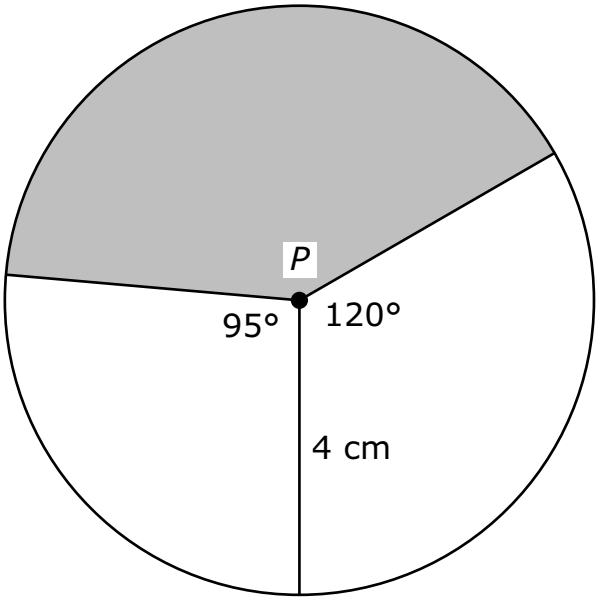
To answer –3 in a question, fill in the answer grid as shown below.



To answer .75 in a question, fill in the answer grid as shown below.



1 Circle *P* with a radius of 4 centimeters is shown.



Which expression represents the area of the shaded sector of circle *P*?

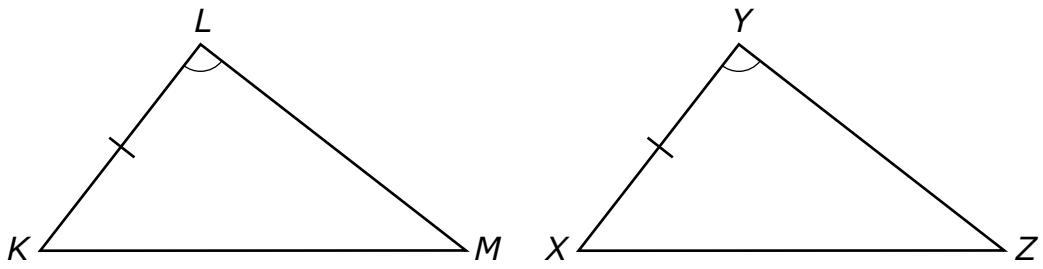
A $\frac{29\pi}{18}$ square centimeters

B $\frac{29\pi}{9}$ square centimeters

C $\frac{16\pi}{3}$ square centimeters

D $\frac{58\pi}{9}$ square centimeters

2 In $\triangle KLM$ and $\triangle XYZ$ shown, $\overline{KL} \cong \overline{XY}$ and $\angle L \cong \angle Y$.



Which statement correctly proves the two triangles are congruent?

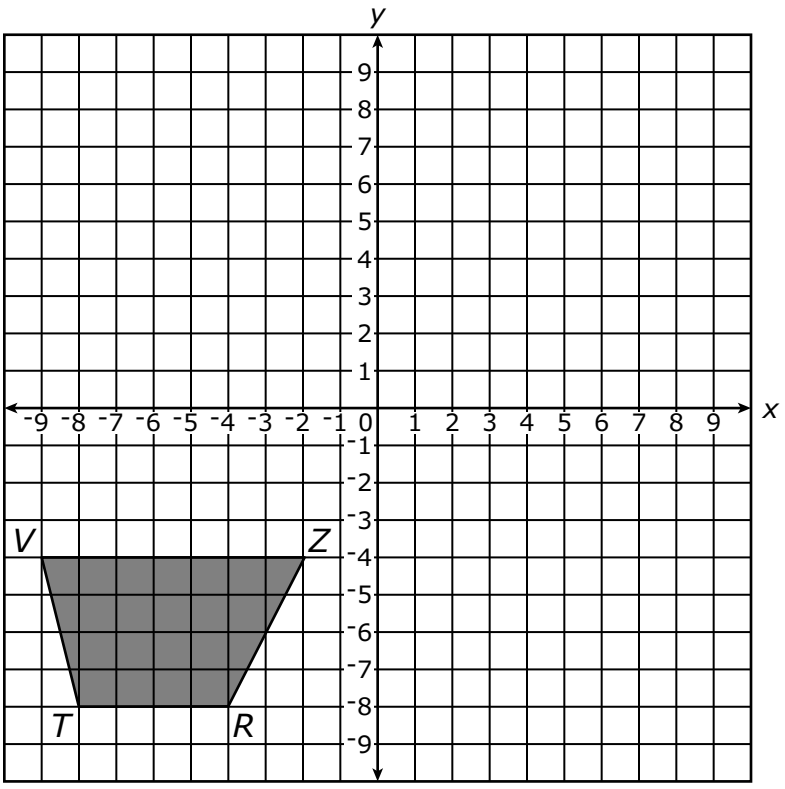
A If $\overline{LM} \cong \overline{YZ}$, then $\triangle KLM \cong \triangle XYZ$ by AAS postulate.

B If $\overline{LM} \cong \overline{YZ}$, then $\triangle KLM \cong \triangle XYZ$ by SSS postulate.

C If $\angle M \cong \angle Z$, then $\triangle KLM \cong \triangle XYZ$ by AAS postulate.

D If $\angle M \cong \angle Z$, then $\triangle KLM \cong \triangle XYZ$ by SSS postulate.

3 Trapezoid *RTVZ* is shown on the coordinate plane.



Trapezoid *RTVZ* will be reflected over the *y*-axis and rotated 90° counterclockwise about the origin to result in the image trapezoid *R′T′V′Z′*.

What will be the coordinates of vertex *R′*?

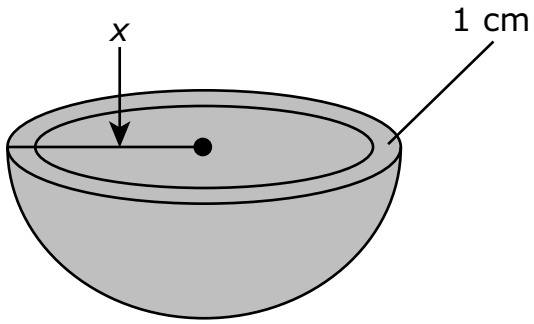
A (−8, −4)

B (4, −8)

C (8, −4)

D (8, 4)

4 Using a three-dimensional printer, an artist will produce several models of hemispheres. The artist uses x to represent the outer radius, in centimeters, of each model, and the material used to make each model is 1 centimeter thick, as shown in the diagram.



The artist will fill each model with colored paint to its maximum capacity. The colored paint costs \$0.01 per cubic centimeter.

Which expression represents the cost, in dollars, of the colored paint needed to fill any model based on x?

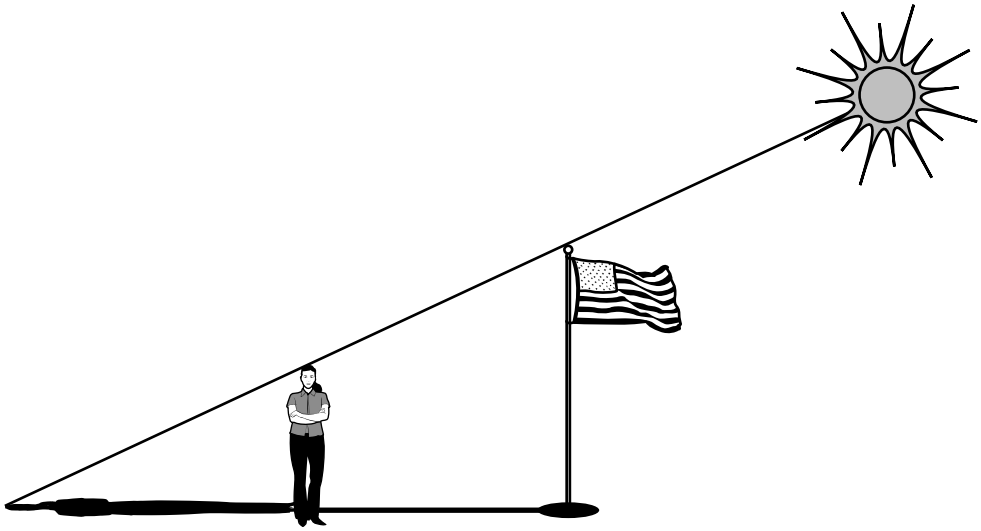
A $0.01 \cdot \frac{2}{3}\pi x^3$

B $0.01 \cdot \frac{4}{3}\pi x^3$

C $0.01 \cdot \frac{2}{3}\pi (x-1)^3$

D $0.01 \cdot \frac{4}{3}\pi (x-1)^3$

5 A student is standing next to a vertical flagpole. The top of the student's shadow coincides with the top of the flagpole's shadow as shown.



not to scale

The student is 62 inches tall. The student estimates that the distance from the flagpole to the point where the student is standing is between 21 and 22 feet.

The student also estimates that the length of the student's shadow is between 7 and $7\frac{1}{2}$ feet.

Based on the given information, what are the **least** and **greatest** possible heights, in **feet**, of the flagpole? Explain how you arrived at your answers.

Enter your answers and explanations in the space provided.

6 A company is designing a soup can that is in the shape of a right circular cylinder. The height of the can will be 3 times the radius of the can. The volume of the can will be 350 cubic centimeters.

Which measurement, in centimeters, is closest to the radius of the soup can?

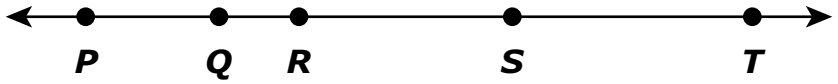
A 2.3 cm

B 3.3 cm

C 6.9 cm

D 9.9 cm

7 Five points are shown on a number line.



Information about some of the lengths of different segments is given.

- The length of $\overline{PQ}$ is 5 units.
- The length of $\overline{RS}$ is equal to the length of $\overline{PR}$.
- The length of $\overline{ST}$ is 3 times the length of $\overline{QR}$.
- The length of $\overline{PT}$ is 25 units.

Which statements are correct?

Select **all** that apply.

A The length of $\overline{QR}$ is 3 units.

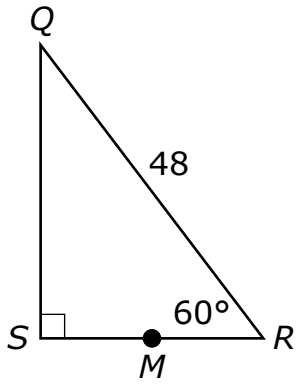
B The length of $\overline{RS}$ is 8 units.

C The length of $\overline{QS}$ is 19 units.

D The length of $\overline{RT}$ is 13 units.

E The length of $\overline{ST}$ is 9 units.

8 In the figure shown, point M is the midpoint of $\overline{RS}$ and the length of $\overline{QR}$ is given in units.



Which value **best** represents the length, in units, of $\overline{RM}$?

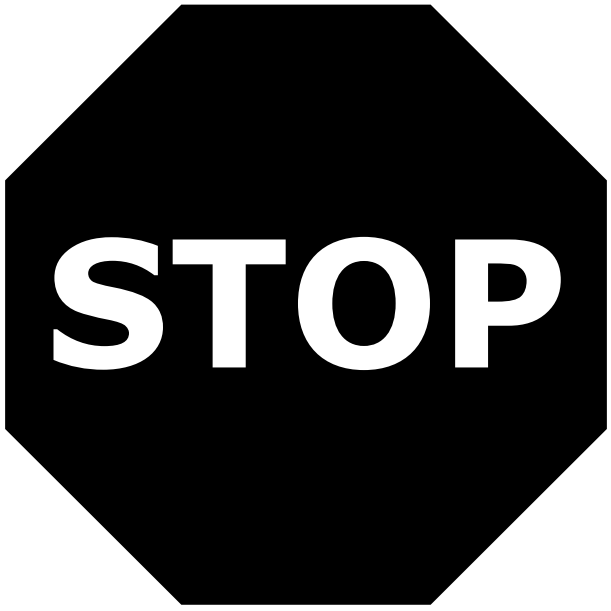
A 41.6

B 24.0

C 20.8

D 12.0

STOP



You have come to the end of Section 4 of the test. Review your answers from Section 4 only.

P

GEO

1161578 1 2 3 4 5 A B C D E Printed in the USA ISD41656