Tennessee Comprehensive Assessment Program

TCAP

Geometry
Test Practice

TN Department of Education

Metadata—Math

Items

Page Number	Grade	Item Type	Key	EOL	TN Standards	Calculator
1	GE	MC	A	3	G.S.CP.B.3b	N
2	GE	MC	C	3	G.SRT.C.5b	N
3	GE	MC	B	3	G.CO.D.11	N
4	GE	MS	B,D	3	G.S.CP.A.1b	N
5	GE	MC	A	3	G.GPE.A.1	N
6	GE	MC	C	4	G.CO.A.4	N
7	GE	MC	A	3	G.SRT.C.4b	N
8	GE	MC	A	3	G.CO.C.8	N
9	GE	MC	B	3	G.SRT.A.2	N
10	GE	MC	C	3	G.CO.D.12	N
11	GE	MC	C	3	G.GMD.A.1	N
12	GE	MS	B,E	3	G.CO.A.4	N
13	GE	MC	D	3	G.S.CP.A.1b	N
15	GE	MC	B	2	G.CO.B.7	Y
16	GE	MC	C	3	G.S.CP.A.1a	Y
17	GE	MC	B	3	G.CO.C.9	Y
18	GE	MS	C,E	3	G.GMD.A.1	Y
19	GE	MC	B	3	G.CO.A.2	Y
20	GE	MC	D	3	G.MG.A.1	Y
21	GE	MC	B	3	G.SRT.C.5c	Y
22	GE	MC	A	3	G.GMD.A.2	Y
23	GE	MC	D	3	G.CO.A.1	Y
24	GE	MC	B	2	G.SRT.A.1	Y
26	GE	MS	C,D	3	G.SRT.A.1	Y
27	GE	MC	D	3	G.GMD.A.2	Y
28	GE	MC	A	3	G.SRT.C.4a	Y
29	GE	MC	D	3	G.CO.C.10	Y
30	GE	FIB	54	3	G.CO.C.9	Y
31	GE	MC	A	3	G.C.A.1	Y
32	GE	MC	C	3	G.N.Q.A.1a	Y
33	GE	TE	Row 1: Parallel Row 2: Neither	2	G.GPE.A.2	Y
34	GE	MC	B	3	G.GPE.A.3	Y
35	GE	MC	A	3	G.S.CP.C.4	Y
36	GE	MC	D	3	G.S.CP.B.3a	Y

37	GE	MC	D	3	G.SRT.B.3	Y
38	GE	MS	C,D	3	G.SRT.A.1	Y
39	GE	MC	A	3	G.MG.A.1	Y
40	GE	MC	B	3	G.SRT.C.5a	Y
41	GE	MC	C	3	G.S.CP.B.2	Y
42	GE	MC	D	3	G.CO.B.5	Y

Metadata Definitions

Grade	Grade level or Course.
Item Type	Indicates the type of item. MC= Multiple Choice; MS= Multiple Select FIB = Fill-in-the-blank; TE = Technology Enhanced
Key	Correct answer.
EOL	Evidence of Learning (EOL) statements provide indication of how students are tracking toward grade-level conceptual understanding of the Tennessee Mathematic Standards. Performance at Level 2 demonstrates that the student is **approaching** grade-level understanding and has a **partial** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards Performance at Level 3 demonstrates that the student has a **comprehensive** understanding and **thorough** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards Performance at Level 4 demonstrated that the student has an **extensive** understanding and **expert** ability to apply the grade-/course-level knowledge and skills defined by the Tennessee Academic Standards
TN Standards	Primary educational standard assessed.
Calculator	Y for items that permit calculator use.

00. A deck of cards contains 20 cards.

- There is an equal number of red, blue, green, and yellow cards.
- Each color has cards numbered 1–5.

A card is drawn at random. What is the probability of selecting an even-numbered card or a blue card?

A. $\frac{11}{20}$

B. $\frac{3}{5}$

C. $\frac{13}{20}$

D. $\frac{3}{4}$

00. A road sign is shaped like an equilateral triangle with side lengths of 48 inches. What is the area of the sign in square inches?

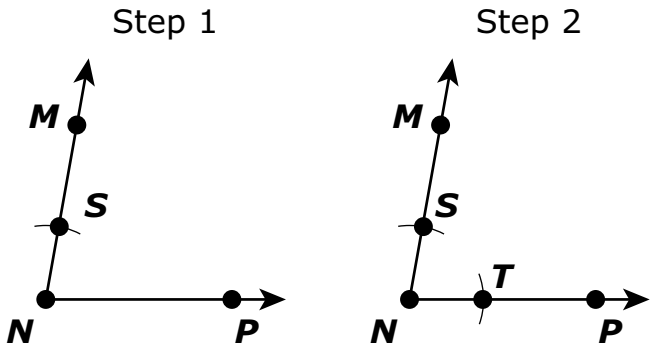
A. $1{,}152\sqrt{3}$

B. $1{,}152\sqrt{2}$

C. $576\sqrt{3}$

D. $576\sqrt{2}$

00. The first two steps for constructing the angle bisector for $\angle MNP$ are shown.



Which could be Step 3 in constructing the angle bisector?

A. Place the compass at point *N* and draw an arc inside $\angle MNP$.

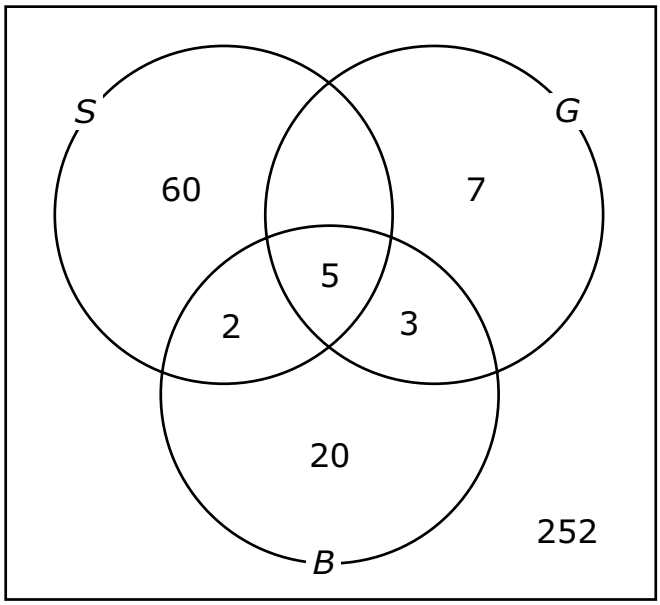
B. Place the compass at point *S* and draw an arc inside $\angle MNP$.

C. Place the compass at point *M* and draw an arc that passes through point *P*.

D. Place the compass at point *N* and draw an arc that passes through points *M* and *P*.

00. The Venn diagram shows the number of students who signed up for extracurricular activities at a high school.

Let S represent the set of all students in sports. Let B represent the set of all students in band. Let G represent the set of all students in school government.



Two students were selected at random.

- Student 1 is in band and school government.
- Student 2 does not participate in any of these three activities.

Which set notations represent the sample space that Student 1 and Student 2 each represent?

Select the **two** correct answers.

A. $B \cup G$ represents Student 1

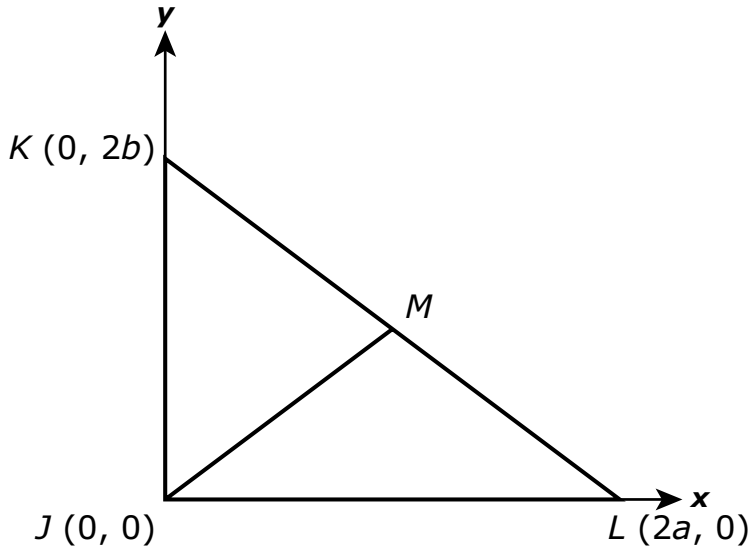
B. $B \cap G$ represents Student 1

C. $B \cap G \cap S$ represents Student 2

D. $B' \cap G' \cap S'$ represents Student 2

E. $B' \cup G' \cup S'$ represents Student 2

00. The coordinates of the vertices of $\triangle JKL$ are shown in the figure. Point M is the midpoint of $\overline{KL}$.



Which statement must be true if $a \neq b$?

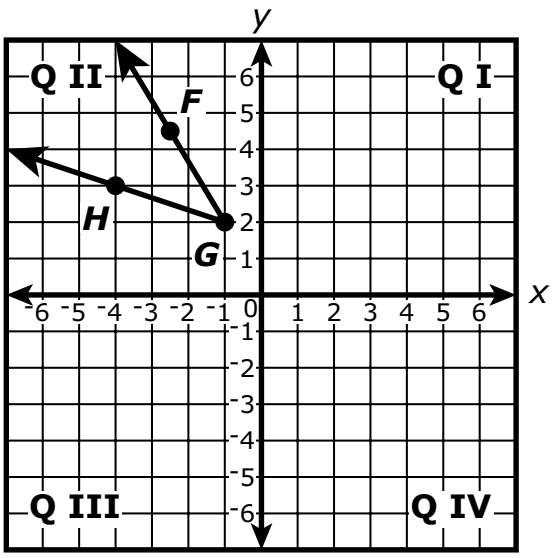
A. $\triangle JML$ is an isosceles triangle with no right angle.

B. $\triangle JML$ is an isosceles triangle with one right angle.

C. $\triangle JML$ is a scalene triangle with no right angle.

D. $\triangle JML$ is a scalene triangle with one right angle.

00. The coordinate plane shows $\angle FGH$. Its image, $\angle F'G'H'$, lies entirely in Quadrant III.



Three students each give a transformation that maps $\angle FGH$ to Quadrant III using only one transformation.

- Student 1 selects a reflection over the x-axis.
- Student 2 selects a vertical translation across the x-axis.
- Student 3 selects a 90° counterclockwise rotation about the origin.

Which students are correct?

A. all three students

B. Students 1 and 2 only

C. Students 1 and 3 only

D. Students 2 and 3 only

00. In a right triangle, $\sin(42 + x)° = \cos(3x)°$.

What is the value of x?

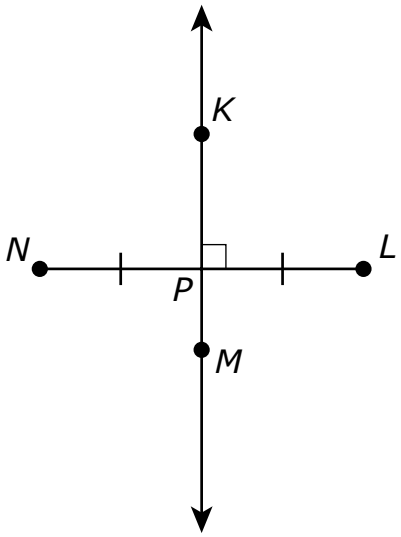
A. 12

B. 21

C. 24

D. 36

00. In the diagram, $\overleftrightarrow{KM}$ intersects $\overline{NL}$ at point P.



Based on the diagram, which congruency statement can be justified?

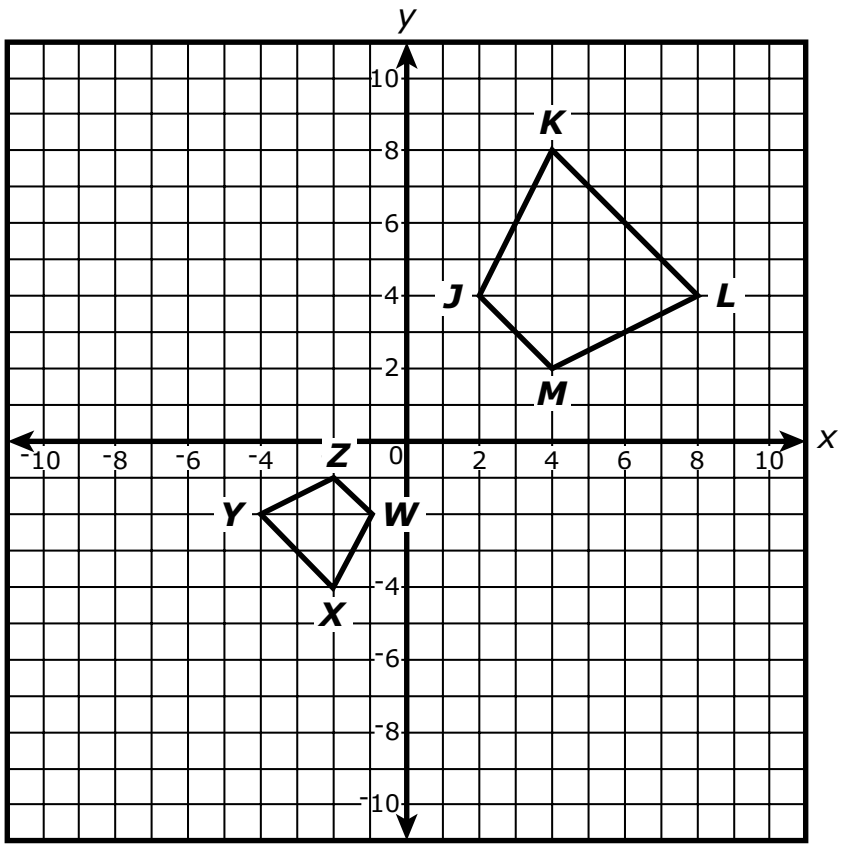
A. $\overline{MN} \cong \overline{ML}$

B. $\overline{KN} \cong \overline{MN}$

C. $\overline{MP} \cong \overline{KP}$

D. $\overline{LP} \cong \overline{LK}$

00. Quadrilaterals *JKLM* and *WXYZ* are graphed on the coordinate plane.



Which statement about the two quadrilaterals is true?

A. Quadrilaterals *JKLM* and *WXYZ* are similar because a reflection across the line $y = x$ maps each figure onto itself.

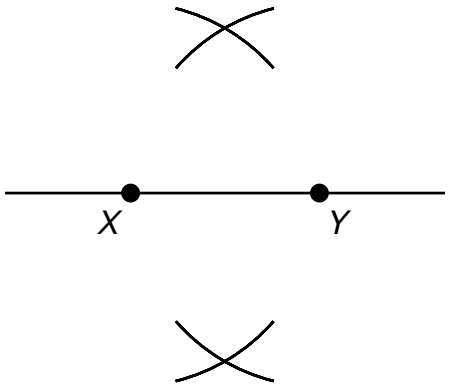
B. Quadrilaterals *JKLM* and *WXYZ* are similar because a rotation of 180° about the origin followed by a dilation maps one figure onto the other.

C. Quadrilaterals *JKLM* and *WXYZ* are not similar, because a dilation by a scale factor greater than 1 results in shapes with different areas.

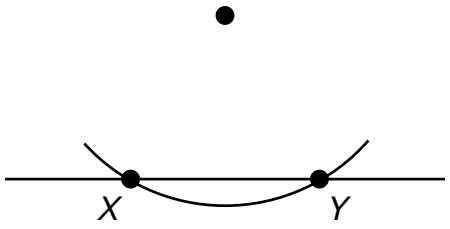
D. Quadrilaterals *JKLM* and *WXYZ* are not similar, because no sequence of transformations maps one quadrilateral onto the other.

00. A student is using a compass and straightedge to construct a square with $\overline{XY}$ as one side. Which option shows the best method for starting the construction?

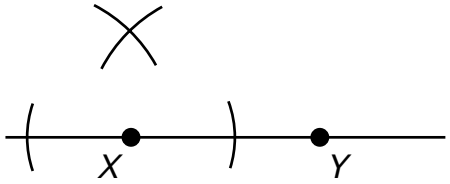
A.



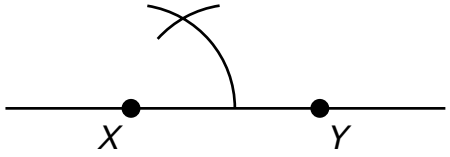
B.



C.



D.



00. The surface area, *SA*, of a cone can be represented by the formula $SA = \pi r^2 + \pi r\sqrt{r^2 + h^2}$.

Which statement correctly interprets parts of the formula?

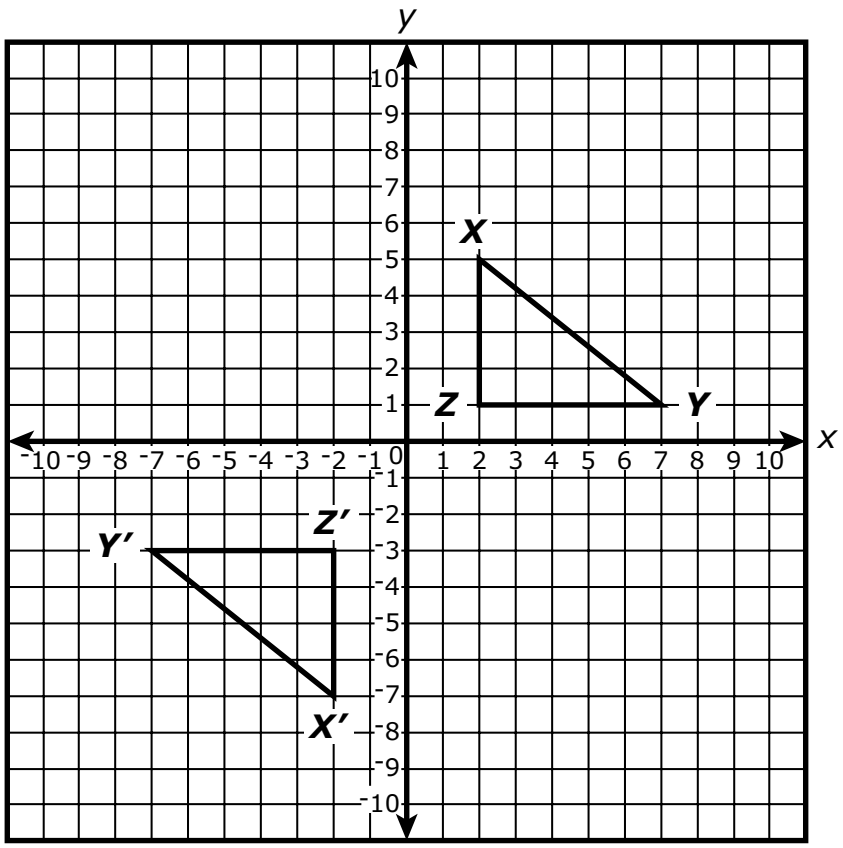
A. The area of the base is represented by πr^2, and the lateral surface area is represented by $\sqrt{r^2 + h^2}$.

B. The lateral surface area is represented by πr^2, and the area of the base is represented by $\sqrt{r^2 + h^2}$.

C. The area of the base is represented by πr^2, and the length of the slant height is represented by $\sqrt{r^2 + h^2}$.

D. The length of the slant height is represented by πr^2, and the area of the base is represented by $\sqrt{r^2 + h^2}$.

00. Triangles XYZ and $X'Y'Z'$ are shown.



Which sequences of transformations will map $\triangle XYZ$ onto $\triangle X'Y'Z'$?

Select the **two** correct answers.

A. Reflect $\triangle XYZ$ over the x-axis, and then reflect it over the y-axis.

B. Reflect $\triangle XYZ$ over the y-axis, and then reflect it over the line $y = -1$.

C. Reflect $\triangle XYZ$ over the line $x = -1$, and then translate it vertically down 4 units.

D. Rotate $\triangle XYZ$ 90° clockwise about the origin, and then reflect it over the y-axis.

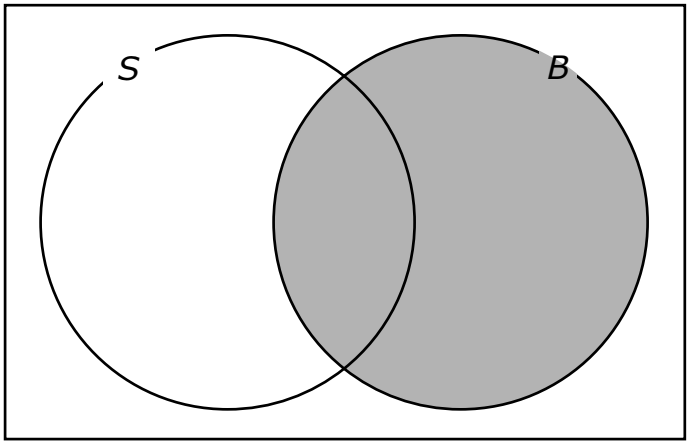
E. Rotate $\triangle XYZ$ 180° clockwise about the origin, and then translate vertically down 2 units.

00. The manager of a breakfast café made a Venn diagram to represent the customers who ordered pancakes.

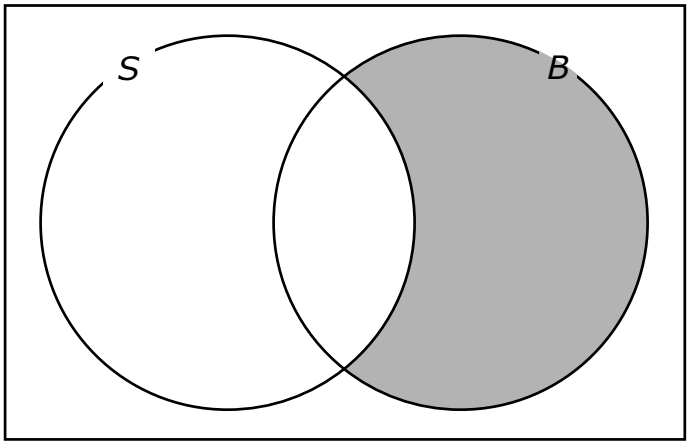
- Let S represent the customers who put maple syrup on their pancakes.
- Let B represent the customers who put butter on their pancakes.

Which Venn diagram has only the set S' shaded?

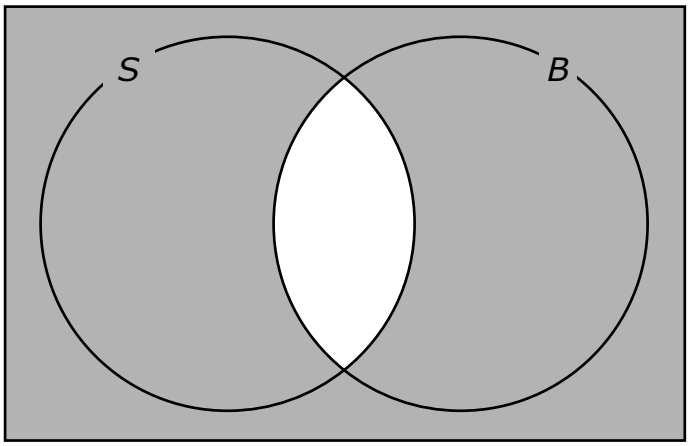
A.



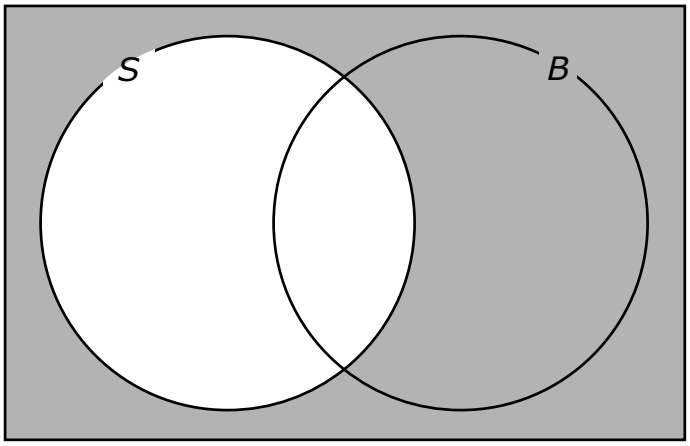
B.



C.



D.



00. A rotation and a translation are applied to a triangle to draw the image of the triangle. Two claims are given about the pre-image and image of the triangle.

- Claim 1: The Angle-Angle-Angle congruence postulate can be used to prove the pre-image and image are congruent.
- Claim 2: The Side-Side-Side congruence postulate can be used to prove the pre-image and image are congruent.

Which statement is true?

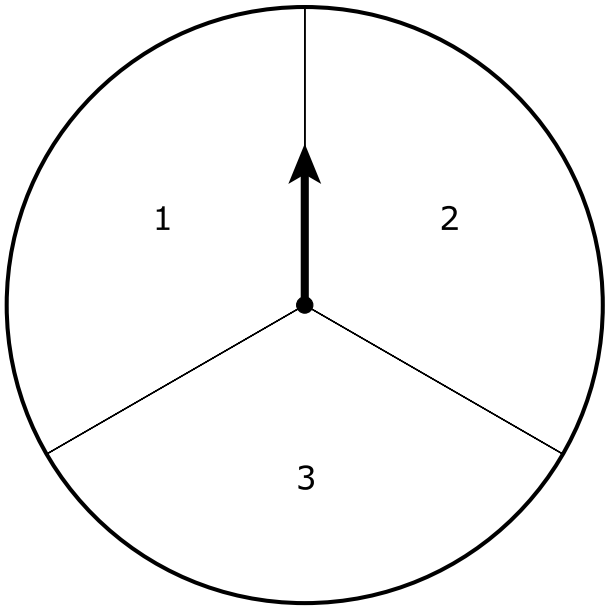
A. Only Claim 1 is valid.

B. Only Claim 2 is valid.

C. Both Claim 1 and Claim 2 are valid.

D. Neither Claim 1 nor Claim 2 is valid.

00. A spinner with three numbered sections is shown.



- Let sample space *S* represent the outcomes of spinning the arrow of the spinner twice.
- Let set *A* represent the event that the arrow of the spinner lands on an odd number for both spins.
- The outcomes of the event are recorded in the form of an ordered pair, where the first coordinate represents the outcome of the first spin and the second coordinate represents the outcome of the second spin.

Which set of ordered pairs represents set *A*?

A. {(1, 1), (3, 3)}

B. {(1, 1), (1, 3), (3, 3)}

C. {(1, 1), (1, 3), (3, 1), (3, 3)}

D. {(1, 1), (1, 2), (1, 3), (3, 1), (3, 2), (3, 3)}

00. The angle measures of the interior angles of a triangle are described.

- The measure of the largest angle is 90 degrees more than the measure of the smallest angle.
- The measure of the remaining angle is 30 degrees more than the measure of the smallest angle.

What is the measure of the **largest** angle of the triangle?

A. 120°

B. 110°

C. 70°

D. 20°

00. A right cone is on top of a right cylinder to form a composite shape.

- The cylinder and cone each have radius r units.
- The cylinder has height h units, and the cone has a different height.
- The total volume, V, of the composite shape in cubic units is given by the formula $V = \pi r^2\left(h + \frac{2}{3}h\right)$.

Based on the formula, which statements **must** be true about the composite shape?

Select the **two** correct answers.

A. The slant height of the cone is $\frac{2}{3}h$ units.

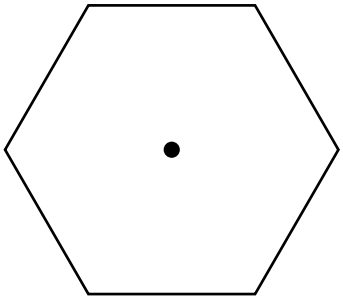
B. The height of the cone is $\frac{2}{3}$ the height of the cylinder.

C. The volume of the cone is $\frac{2}{3}$ the volume of the cylinder.

D. The total height of the composite shape is $\left(h + \frac{2}{3}h\right)$ units.

E. The bases of the cylinder and cone each have area πr^2 square units.

00. A regular hexagon and its center point are shown.



The hexagon is rotated 360° about the center point. How many times will the hexagon be carried onto itself during the rotation?

A. 8

B. 6

C. 4

D. 2

00. The rectangular floor in a room is described.

- The floor is completely covered by 60 congruent tiles. The tiles do not overlap. The length and width of each tile is 10 inches.
- A circular rug with a diameter of 5 feet covers part of the tiles on the floor.

Which expression represents the area, in square feet, of the floor that is **not** covered by the circular rug?

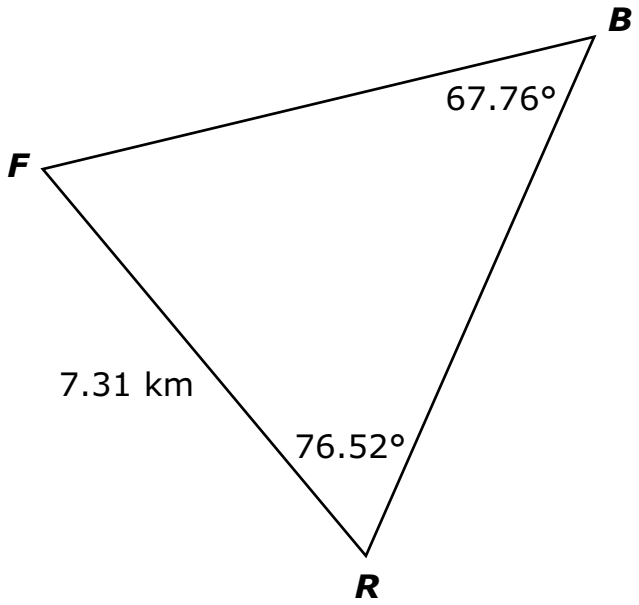
A. $5\left(\frac{5}{6}\right)^2 - 5\pi$

B. $5\left(\frac{5}{6}\right)^2 - \left(\frac{5}{2}\right)^2\pi$

C. $60 \cdot 10^2 - 5\pi$

D. $60\left(\frac{5}{6}\right)^2 - \left(\frac{5}{2}\right)^2\pi$

00. The locations of cell phone towers *F*, *R*, and *B* form a triangle. Some measurements are shown.



Note: Figure is not drawn to scale.

Which value best represents the distance, in kilometers, between towers *B* and *R*?

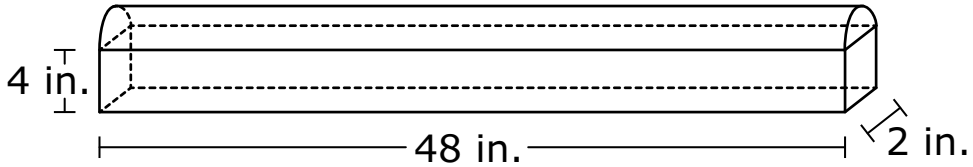
A. 4.39

B. 4.61

C. 6.77

D. 7.68

00. A solid handrail in the composite shape of a half-cylinder placed on a rectangular prism is shown.



(Figure is not drawn to scale)

Which value is closest to the volume, in cubic inches, of the handrail?

A. 459.4

B. 534.8

C. 610.2

D. 685.6

00. Triangle RST will be reflected across the line represented by $y = 1$ to draw $\triangle R'S'T'$.

Which mapping can be used to determine the coordinates of the vertices of $\triangle R'S'T'$?

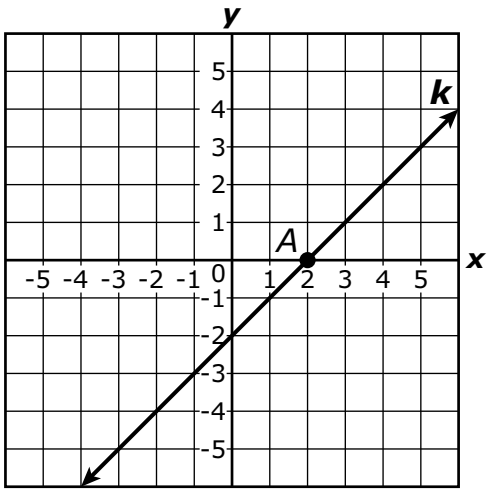
A. $(x, y) \rightarrow (-x + 1, y)$

B. $(x, y) \rightarrow (-x + 2, y)$

C. $(x, y) \rightarrow (x, -y + 1)$

D. $(x, y) \rightarrow (x, -y + 2)$

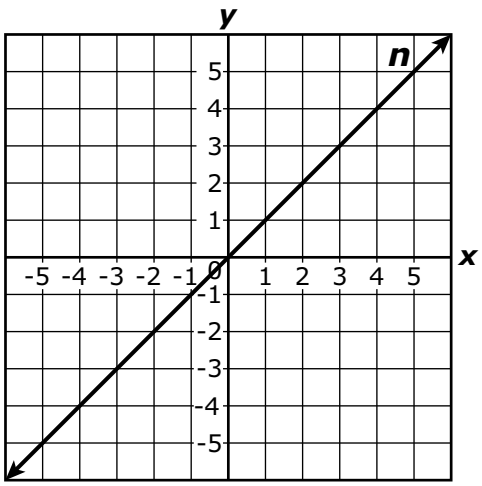
00. Point *A* lies on line *k*, as shown.



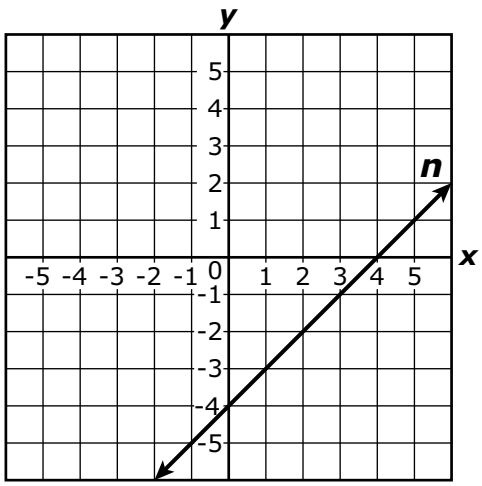
Line *k* will be dilated by a scale factor of 2 centered at point *A* to draw line *n*.

Which graph best represents line *n*?

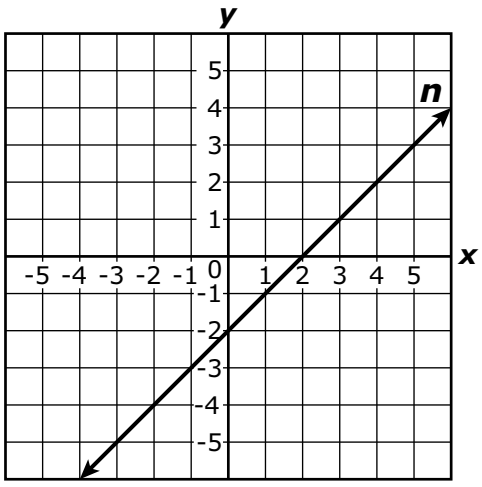
A.



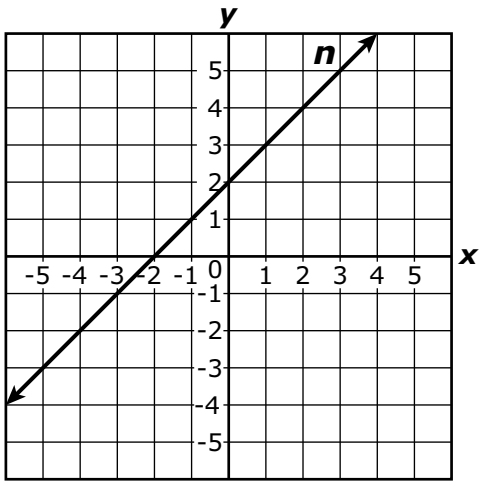
C.



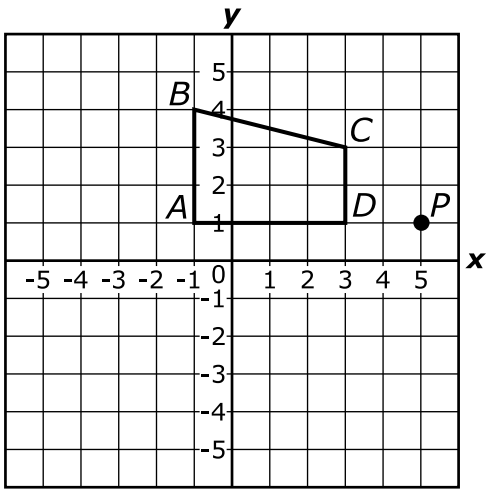
B.



D.



00. Quadrilateral *ABCD* and point *P* are shown in the coordinate plane.



Quadrilateral *ABCD* will be dilated by a scale factor of 1.5 centered at point *P* to draw quadrilateral *A′B′C′D′*.

Which statements are true?

Select the **two** that apply.

A. $\overline{AD}$ and $\overline{A'D'}$ are parallel.

B. $\overline{AD}$ and $\overline{A'D'}$ are perpendicular.

C. $\overline{AD}$ and $\overline{A'D'}$ lie on the same line.

D. The length of $\overline{AD}$ is less than the length of $\overline{A'D'}$.

E. The length of $\overline{AD}$ and the length of $\overline{A'D'}$ are equal.

00. A shipping box is shaped like a cube. The volume of the box is 1,728 cubic inches. What is the surface area of the box?

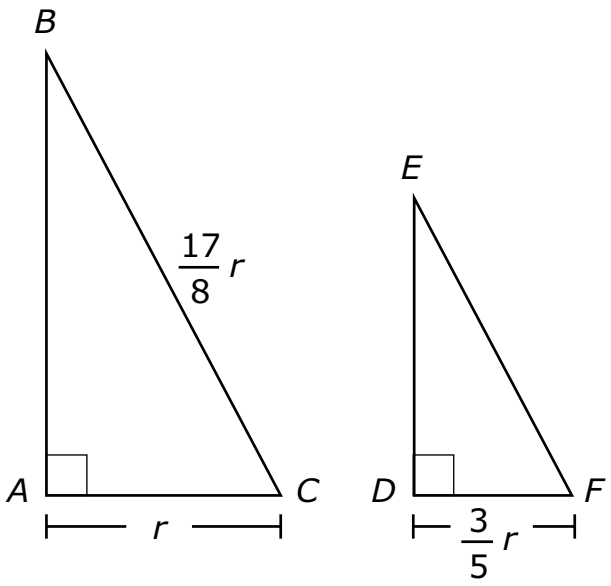
A. 144 square inches

B. 288 square inches

C. 576 square inches

D. 864 square inches

00. In the figure shown, $\triangle ABC \sim \triangle DEF$.



Which statement is true?

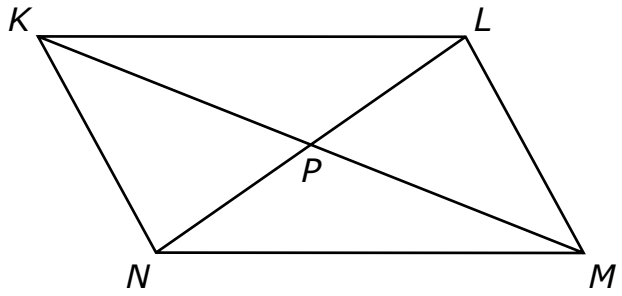
A. $\sin(E) = \frac{8}{17}$

B. $\sin(E) = \frac{24}{85}$

C. $\cos(E) = \frac{8}{17}$

D. $\cos(E) = \frac{24}{85}$

00. The diagonals of parallelogram *KLMN* intersect at point *P*, and m∠*KLM* = 118°.



Which statement is true?

A. Angles *LKM* and *KML* are congruent because they are alternate interior angles.

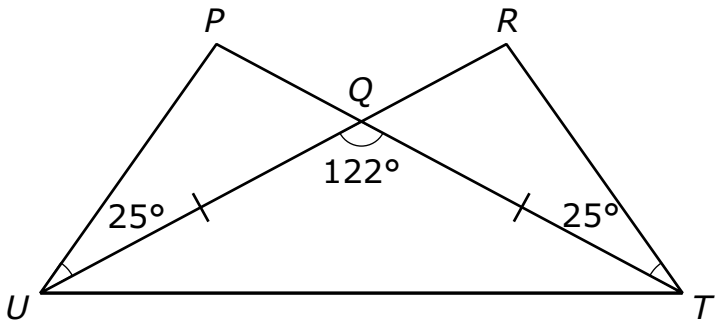
B. Angles *LKM* and *KPN* are congruent because they are alternate interior angles.

C. Line segments *LP* and *KP* are congruent because the diagonals of a parallelogram bisect each other.

D. Line segments *LP* and *NP* are congruent because the diagonals of a parallelogram bisect each other.

00. The figure shown has these properties.

- Triangle UQT is isosceles.
- $m\angle UQT = 122°$
- $m\angle PUQ = 25°$; $m\angle RTQ = 25°$



What is the measure of $\angle RTU$ in degrees?

Enter your answer in the space provided.

00. A rotating lawn sprinkler waters a circular area with a diameter of 50 feet. To prevent water from going into the street, a homeowner sets the sprinkler to cover only the area encompassed within the shorter arc between 40° and 120°.

Which measurement is closest to the area, in square feet, watered by the lawn sprinkler?

A. 436

B. 654

C. 873

D. 1,745

00. A rain barrel is shaped like a cylinder with a radius of 15 inches and a height of 3.5 feet.

Which value best approximates the volume of the barrel in **cubic feet**?

A. 4.3

B. 5.5

C. 17.2

D. 24.7

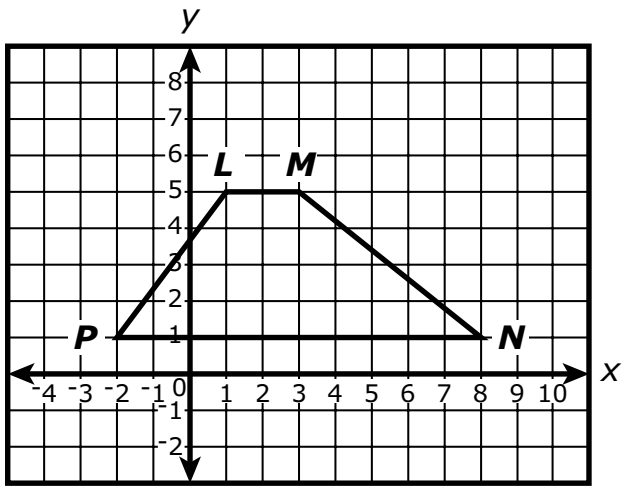
00. The equation for line s is $y = -\frac{1}{2}x + 3$.

Determine whether the line represented by each equation is parallel to line s, perpendicular to line s, or neither.

Select **one** box per row.

		A	*B*	*C*
		Parallel	**Perpendicular**	**Neither**
1	$2x + 4y = -8$	◯	◯	◯
2	$-x + 2y = 6$	◯	◯	◯

00. Trapezoid *LMNP* is graphed on the coordinate plane.



Which value best represents the perimeter of trapezoid *LMNP* in units?

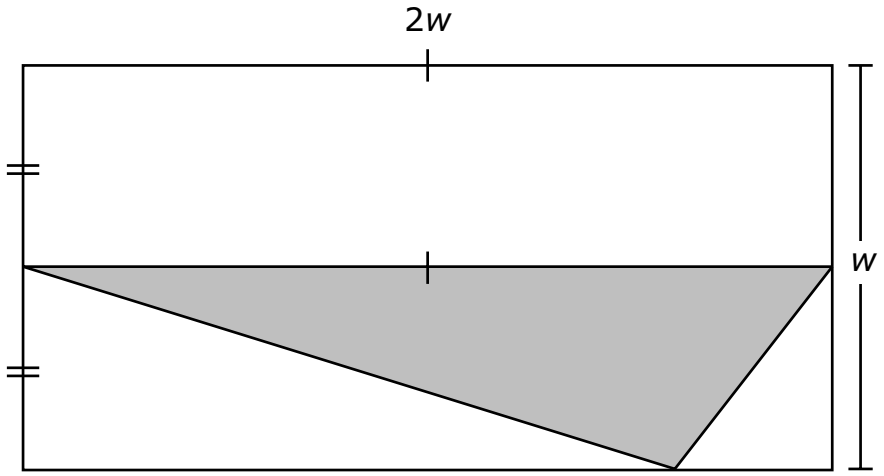
A. 22.0

B. 23.4

C. 24.8

D. 28.0

00. A company logo has a triangle inside of a rectangle. The length of the rectangle is double the width w.



What is the probability that a randomly selected point from the logo is in the shaded region?

A. $\frac{1}{4}$

B. $\frac{1}{3}$

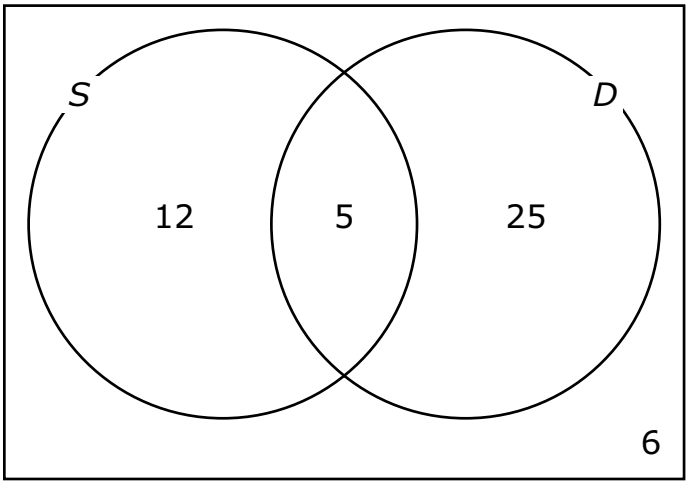
C. $\frac{w}{4}$

D. $\frac{w}{3}$

00. A group of actors are auditioning for a role in a play. The director asks the actors if they can sing or dance. The Venn diagram shows the results.

- Let *S* represent the actors who can sing.
- Let *D* represent the actors who can dance.

Actors Auditioning for a Play



Which expression correctly shows how to determine the probability of selecting an actor who can sing or dance?

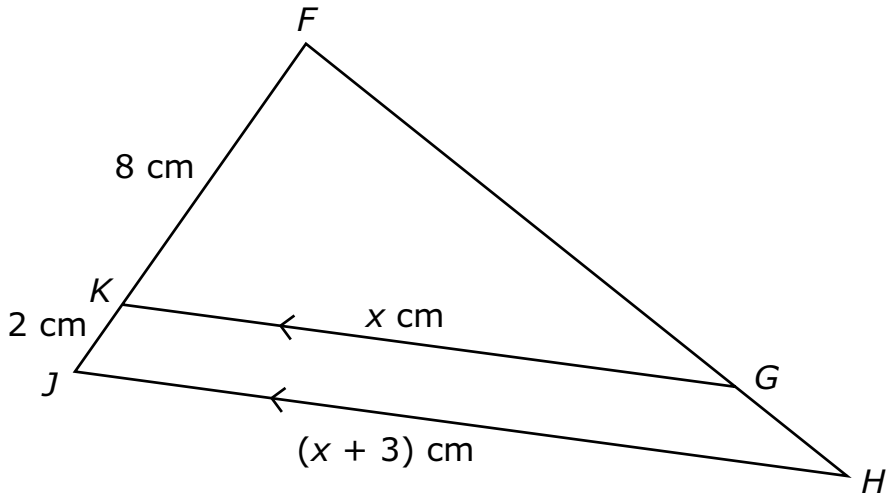
A. $\frac{12}{48}+\frac{25}{48}$

B. $\frac{17}{48}+\frac{30}{48}$

C. $\frac{12}{48}+\frac{25}{48}-\frac{5}{48}$

D. $\frac{17}{48}+\frac{30}{48}-\frac{5}{48}$

00. In △*FHJ*, point *G* is on side *FH* and point *K* is on side *FJ*. Side *JH* is parallel to segment *KG*. Some measures are given.



What is the length of *JH* in centimeters?

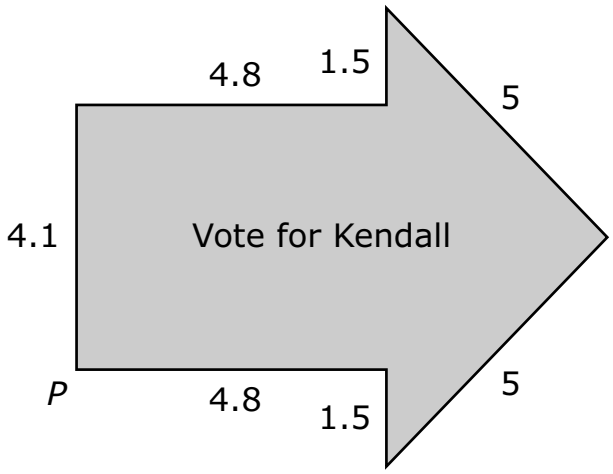
A. 10

B. 12

C. 13

D. 15

00. Kendall is making a campaign badge for his friends to wear during the student council election. Each badge is made of a rectangle and a triangle. The dimensions shown are in centimeters.



Kendall wants to make a campaign poster by dilating the badge design using a scale factor of 5 with point *P* as the center of dilation. Which statements about the campaign poster are true?

Select the **two** correct answers.

A. The area of the campaign poster will be 5 times the area of the campaign badge.

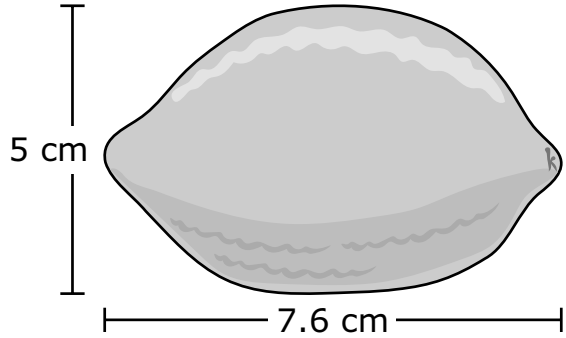
B. Only the lengths of the sides of the campaign poster that contain point *P* will be changed.

C. The perimeter of the campaign poster will be 5 times the perimeter of the campaign badge.

D. Each angle in the campaign poster will be congruent to the corresponding angle in the campaign badge.

E. The length of each side of the campaign poster will be 5 centimeters longer than the corresponding side of the badge.

00. Some dimensions of an oblong-shaped lemon are given in centimeters.



Which method best describes how to estimate the volume of this lemon in cubic centimeters?

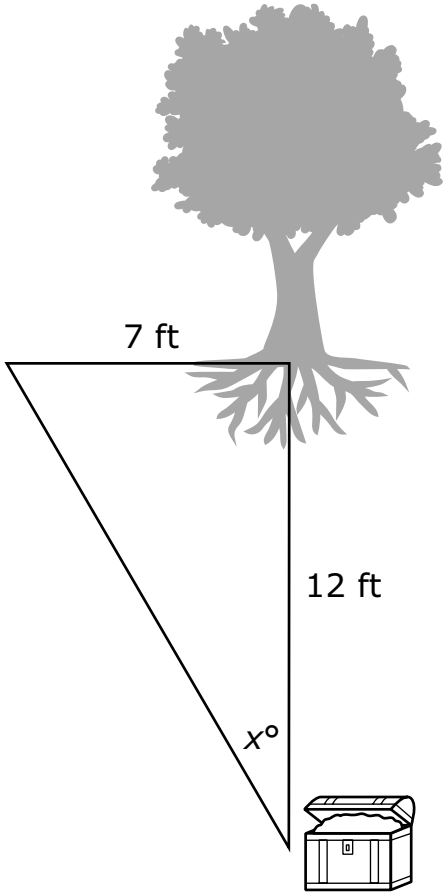
A. Slice the lemon vertically into two equal cones, then double the volume of a cone with a height of 3.8 centimeters and a radius of 2.5 centimeters.

B. Slice the lemon vertically into two equal cones, then double the volume of a cone with a height of 2.5 centimeters and a radius of 3.8 centimeters.

C. Slice the lemon horizontally into two equal cylinders, then double the volume of a cylinder with a height of 3.8 centimeters and a radius of 2.5 centimeters.

D. Slice the lemon horizontally into two equal cylinders, then double the volume of a cylinder with a height of 2.5 centimeters and a radius of 3.8 centimeters.

00. Paul is searching for a chest containing family keepsakes that is buried 12 feet below a certain point on his farm. A tree has grown on that point, so Paul begins digging 7 feet away from the tree. The figure shows the situation with an angle labeled $x°$.



Which measure is closest to the value of x in degrees?

A. 13.9

B. 30.3

C. 54.3

D. 59.7

00. On two different days, a restaurant owner recorded the number of people who ordered a salad with dinner.

People Who Ordered Salad with Dinner

	Saturday	Sunday	Total
Small Salad	12	28	40
Medium Salad	45	20	65
Large Salad	18	32	50
No Salad	5	20	25
Total	80	100	180

What is the probability that a randomly selected customer on Saturday ordered a large salad?

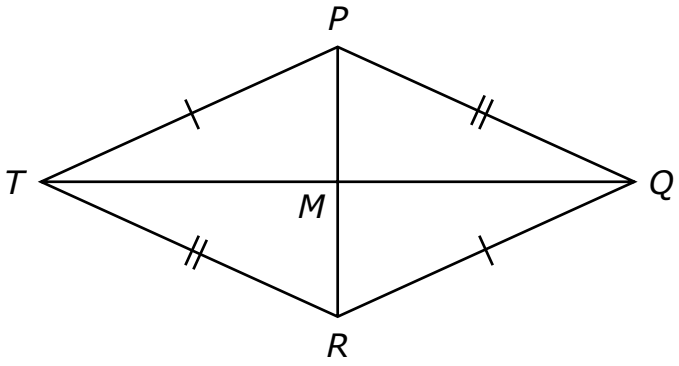
A. $\frac{1}{10}$

B. $\frac{1}{4}$

C. $\frac{9}{40}$

D. $\frac{9}{25}$

00. The figure shows parallelogram $PQRT$. Point M is the midpoint of $\overline{TQ}$ and $\overline{PR}$.



Which single transformation can be used to prove that $\triangle PTR \cong \triangle RQP$?

A. a reflection over $\overline{PR}$

B. a reflection over $\overline{TQ}$

C. a 90° clockwise rotation around point M

D. a 180° counterclockwise rotation around point M

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Geometry
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