FSA Geometry End-of-Course Review Packet Answer Key

Congruency Similarity and Right Triangles

FSA Geometry EOC Review

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MAFS.912.G-CO.1.1 EOC Practice

Level 2	Level 3	Level 4	Level 5
uses definitions to choose examples and non-examples	uses precise definitions that are based on the undefined notions of point, line, distance along a line, and distance around a circular arc	analyzes possible definitions to determine mathematical accuracy	explains whether a possible definition is valid by using precise definitions

1. Let's say you opened your laptop and positioned the screen so it's exactly at 90°—a right angle—from your keyboard. Now, let's say you could take the screen and push it all the way down beyond 90°, until the back of the screen is flat against your desk. It looks as if the angle disappeared, but it hasn't. What is the angle called, and what is its measurement?

   A. Straight angle at 180°
   B. Linear angle at 90°
   C. Collinear angle at 120°
   D. Horizontal angle at 180°

2. What is defined below?
   ___________: a portion of a line bounded by two points

   A. arc
   B. axis
   C. ray
   D. segment

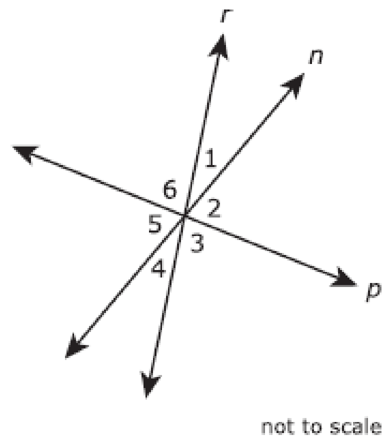
3. Given $\overleftrightarrow{XY}$ and $\overleftrightarrow{ZW}$ intersect at point A.
   Which conjecture is **always** true about the given statement?

   A. $XA = AY$
   B. $\angle XAZ$ is acute.
   C. $\overleftrightarrow{XY}$ is perpendicular to $\overleftrightarrow{ZW}$
   D. X, Y, Z, and W are noncollinear.

4. The figure shows lines r, n, and p intersecting to form angles numbered 1, 2, 3, 4, 5, and 6. All three lines lie in the same plane.

   Based on the figure, which of the individual statements would provide enough information to conclude that line r is perpendicular to line p? Select **ALL** that apply.

   - [ ] $m\angle 2 = 90°$
   - [ ] $m\angle 6 = 90°$
   - [ ] $m\angle 3 = m\angle 6$
   - [ ] $m\angle 1 + m\angle 6 = 90°$
   - [ ] $m\angle 3 + m\angle 4 = 90°$
   - [ ] $m\angle 4 + m\angle 5 = 90°$



5. Match each term with its definition.

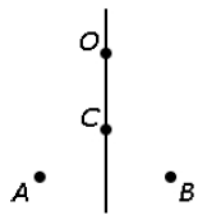
A	A portion of a line consisting of two points and all points between them.
B	A connected straight path. It has no thickness and it continues forever in both directions.
C	A figure formed by two rays with the same endpoint.
D	The set of all points in a plane that are a fixed distance from a point called the center.
E	A portion of a line that starts at a point and continues forever in one direction.
F	Lines that intersect at right angles.
G	A specific location, it has no dimension and is represented by a dot.
H	Lines that lie in the same plane and do not intersect

F	perpendicular lines
C	angle
A	line segment
H	parallel lines
D	circle
G	point
B	line
E	ray

MAFS.912.G-CO.1.2 EOC Practice

Level 2	Level 3	Level 4	Level 5
represents transformations in the plane; determines transformations that preserve distance and angle to those that do not	uses transformations to develop definitions of angles, perpendicular lines, parallel lines; describes translations as functions	uses transformations to develop definitions of circles and line segments; describes rotations and reflections as functions	[intentionally left blank]

1. A transformation takes point A to point B. Which transformation(s) could it be?

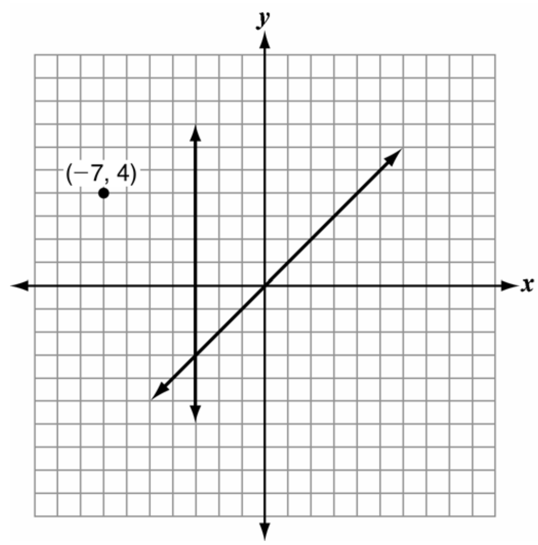


$\overleftrightarrow{AB} \perp \overleftrightarrow{OC}$ $\quad AC = CB$

F is some reflection.
R is some rotation about *O*.
T is some translation.

A. F only
B. F and R only
C. F and T only
D. F, R, and T

2. The point $(-7,4)$ is reflected over the line $x = -3$. Then, the resulting point is reflected over the line $y = x$. Where is the point located after both reflections?



A. $(-10,-7)$
B. $(1,4)$
C. $(4,-7)$
D. $(4,1)$

3. Given: $\overline{AB}$ with coordinates of $A(-3,-1)$ and $B(2,1)$
$\overline{A'B'}$ with coordinates of $A'(-1,2)$ and $B'(4,4)$

Which translation was used?

A. $(x',y') \rightarrow (x+2, y+3)$
B. $(x',y') \rightarrow (x+2, y-3)$
C. $(x',y') \rightarrow (x-2, y+3)$
D. $(x',y') \rightarrow (x-2, y-3)$

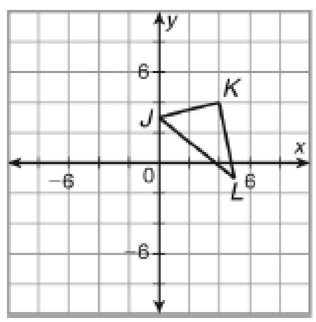
4. Point P is located at (4, 8) on a coordinate plane. Point P will be reflected over the x-axis. What will be the coordinates of the image of point P?

   A. $(-8, 4)$
   B. $(-4, 8)$
   C. $(4, -8)$
   D. $(8, 4)$

5. Point F' is the image when point F is reflected over the line $x = -2$ and then over the line $y = 3$. The location of F' is $(3, 7)$. Which of the following is the location of point F?

   A. $(-7, -1)$
   B. $(-7, 7)$
   C. $(1, 5)$
   D. $(1, 7)$

6. ΔJKL is rotated $90°$ about the origin and then translated using $(x, y) \rightarrow (x - 8, y + 5)$. What are the coordinates of the final image of point L under this composition of transformations?

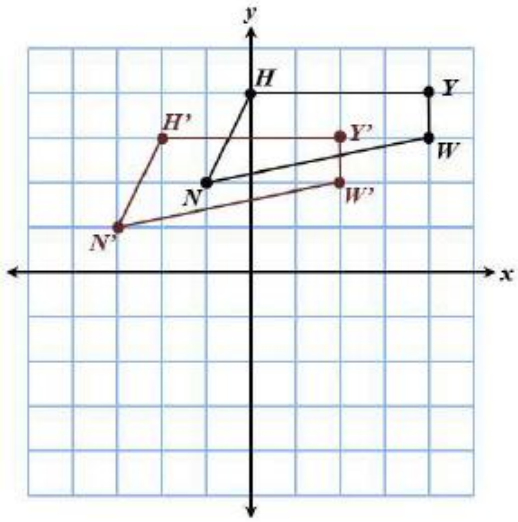


   A. $(-7, 10)$
   B. $(-7, 0)$
   C. $(-9, 10)$
   D. $(-9, 0)$

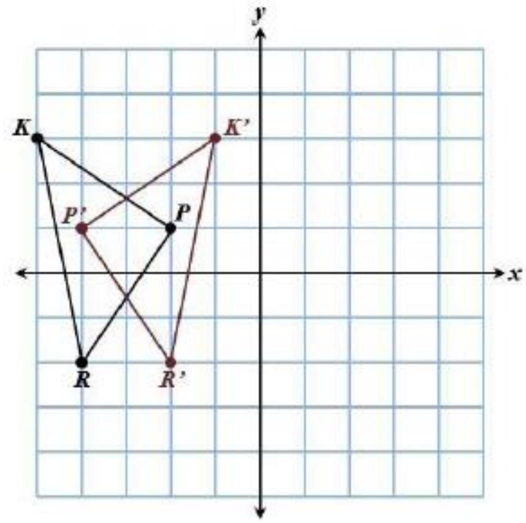
MAFS.912.G-CO.1.4 EOC Practice

Level 2	Level 3	Level 4	Level 5
represents transformations in the plane; determines transformations that preserve distance and angle to those that do not	uses transformations to develop definitions of angles, perpendicular lines, parallel lines; describes translations as functions	uses transformations to develop definitions of circles and line segments; describes rotations and reflections as functions	[intentionally left blank]

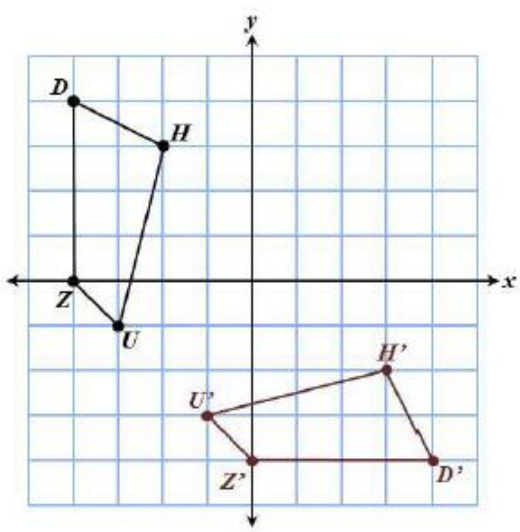
1. The graph of a figure and its image are shown below. Identify the transformation to map the image back onto the figure.



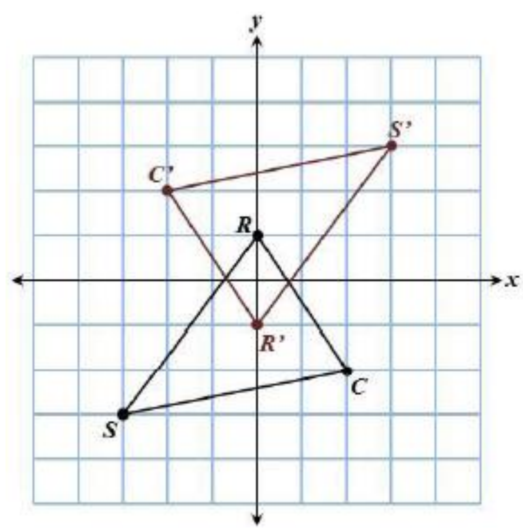
- ○ Reflection
- ○ Rotation
- ○ Translation



- ○ Reflection
- ○ Rotation
- ○ Translation



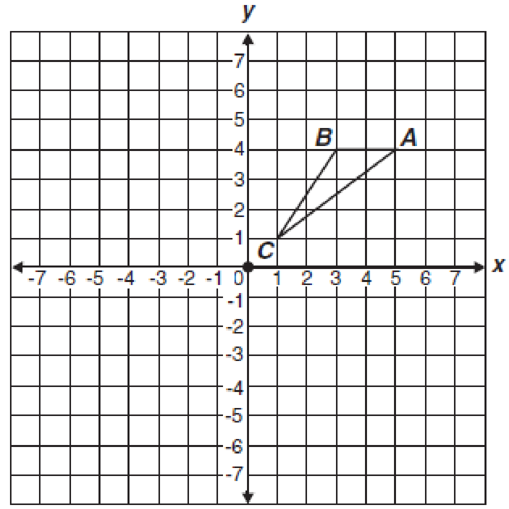
- ○ Reflection
- ○ Rotation
- ○ Translation



- ○ Reflection
- ○ Rotation
- ○ Translation

2. If triangle ABC is rotated 180 degrees about the origin, what are the coordinates of A′?

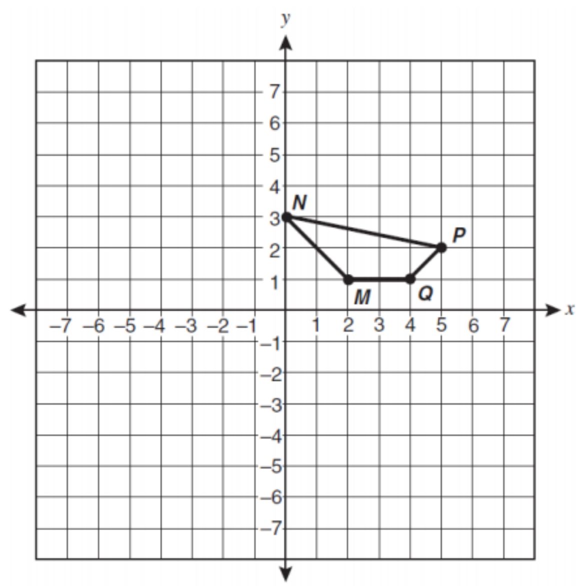
$A'(-5,-4)$



3. Darien drew a quadrilateral on a coordinate grid.

Darien rotated the quadrilateral 180 and then translated it left 4 units. What are the coordinates of the image of point P?

$P'(-9,-2)$



4. What is the image of $M(11,-4)$ using the translation $(x,y) \rightarrow x-17, y+2$?

A. $M'(-6,-2)$
B. $M'(6,2)$
C. $M'(-11,4)$
D. $M'(-4,11)$

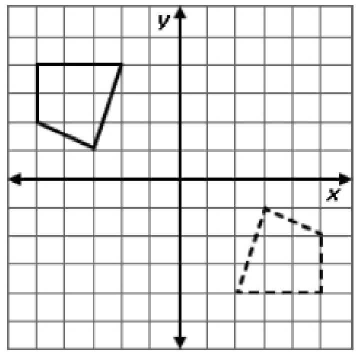
5. A person facing east walks east 20 paces, turns, walks north 10 paces, turns, walks west 25 paces, turns, walks south 10 paces, turns, walks east 15 paces, and then stops. What one transformation could have produced the same final result in terms of the position of the person and the direction the person faces?

A. reflection over the north-south axis
B. rotation
C. translation
D. reflection over the east-west axis

MAFS.912.G-CO.1.5 EOC Practice

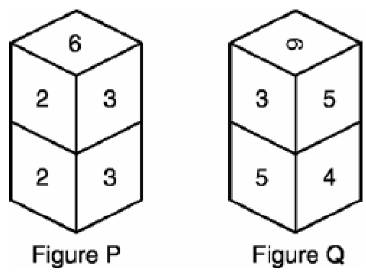
Level 2	Level 3	Level 4	Level 5
chooses a sequence of two transformations that will carry a given figure onto itself or onto another figure	uses transformations that will carry a given figure onto itself or onto another figure	uses algebraic descriptions to describe rotations and/or reflections that will carry a figure onto itself or onto another figure	applies transformations that will carry a figure onto another figure or onto itself, given coordinates of the geometric figure in the stem

1. Which transformation maps the solid figure onto the dashed figure?



A. rotation 180° about the origin
B. translation to the right and down
C. reflection across the x-axis
D. reflection across the y-axis

2. Ken stacked 2 number cubes. Each cube was numbered so that opposite faces have a sum of 7.



Which transformation did Ken use to reposition the cubes from figure P to figure Q?

A. Rotate the top cube $180°$, and rotate the bottom cube $180°$.
B. Rotate the top cube $90°$ clockwise, and rotate the bottom cube $180°$.
C. Rotate the top cube $90°$ counterclockwise, and rotate the bottom cube$180°$.
D. Rotate the top cube $90°$ counterclockwise, and rotate the bottom cube $90°$ clockwise.

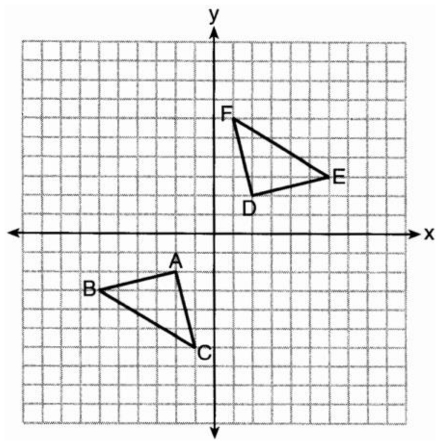
3. A triangle has vertices at $A(-7,6), B(4,9), C(-2,-3)$. What are the coordinates of each vertex if the triangle is translated 4 units right and 6 units down?

A. $A'(-11,12), B'(0,15), C'(-6,3)$
B. $A'(-11,0), B'(0,3), C'(-6,-9)$
C. $A'(-3,12), B'(8,15), C'(2,3)$
D. $A'(-3,0), B'(8,3), C'(2,-9)$

4. A triangle has vertices at $A(-3,-1), B(-6,-5), C(-1,-4)$. Which transformation would produce an image with vertices $A'(3,-1), B'(6,-5), C'(1,-4)$?

   A. a reflection over the $x-axis$
   B. a reflection over the $y-axis$
   C. a rotation $90°$ clockwise
   D. a rotation $90°$ counterclockwise

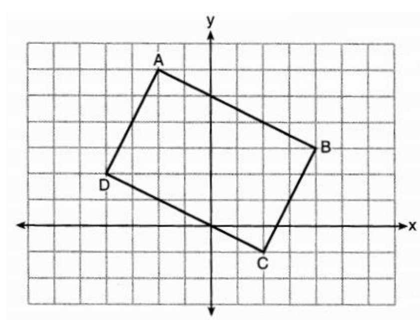
5. Triangle ABC and triangle DEF are graphed on the set of axes below.



   Which sequence of transformations maps triangle ABC onto triangle DEF?

   A. a reflection over the x –axis followed by a reflection over the y –axis
   B. a $180°$ rotation about the origin followed by a reflection over the line $y = x$
   C. a $90°$ clockwise rotation about the origin followed by a reflection over the y –axis
   D. a translation 8 units to the right and 1 unit up followed by a $90°$ counterclockwise rotation about the origin

6. Quadrilateral ABCD is graphed on the set of axes below.



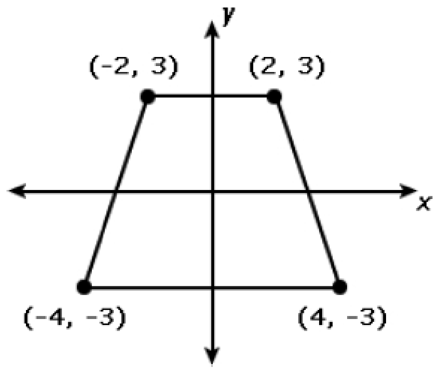
   When ABCD is rotated 90° in a counterclockwise direction about the origin, its image is quadrilateral A' B 'C 'D'. Is distance preserved under this rotation, and which coordinates are correct for the given vertex?

   A. No and $C'(1,2)$
   B. No and $D'(2,4)$
   C. Yes and $A'(6,2)$
   D. Yes and $B'(-3,4)$

MAFS.912.G-CO.1.3 EOC Practice

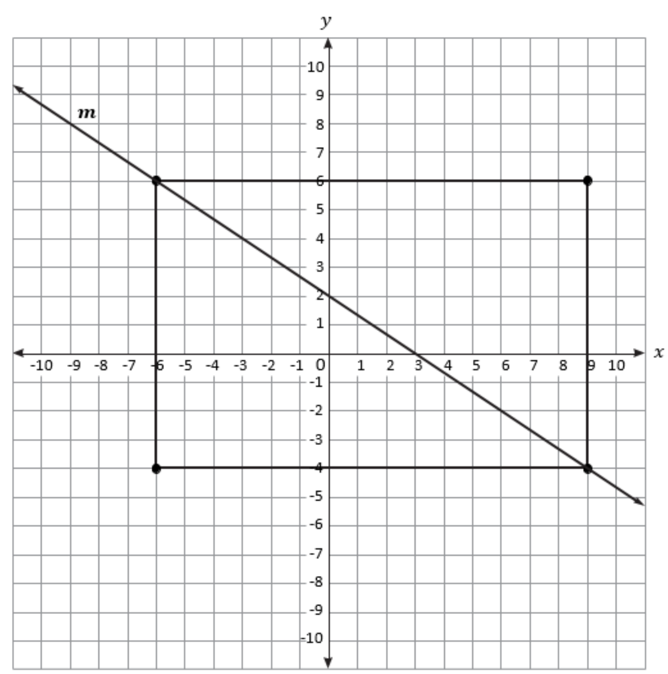
Level 2	Level 3	Level 4	Level 5
chooses a sequence of two transformations that will carry a given figure onto itself or onto another figure	uses transformations that will carry a given figure onto itself or onto another figure	uses algebraic descriptions to describe rotations and/or reflections that will carry a figure onto itself or onto another figure	applies transformations that will carry a figure onto another figure or onto itself, given coordinates of the geometric figure in the stem

1. Which transformation will place the trapezoid onto itself?



A. counterclockwise rotation about the origin by 90°
B. rotation about the origin by 180°
C. reflection across the x-axis
D. reflection across the y-axis

2. Which transformation will carry the rectangle shown below onto itself?

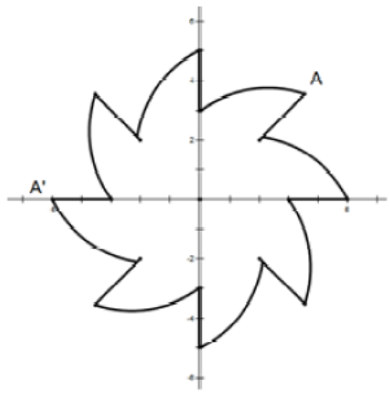


A. a reflection over line m
B. a reflection over the line $y = 1$
C. a rotation 90° counterclockwise about the origin
D. a rotation 270° counterclockwise about the origin

3. Which figure has $90°$ rotational symmetry?

   A. Square
   B. Regular hexagon
   C. Regular pentagon
   D. Equilateral triangle

4. Determine the angle of rotation for A to map onto A'.



   A. $45°$
   B. $90°$
   C. $135°$
   D. $180°$

5. Which regular polygon has a minimum rotation of $45°$ to carry the polygon onto itself?

   A. octagon
   B. decagon
   C. decagon
   D. pentagon

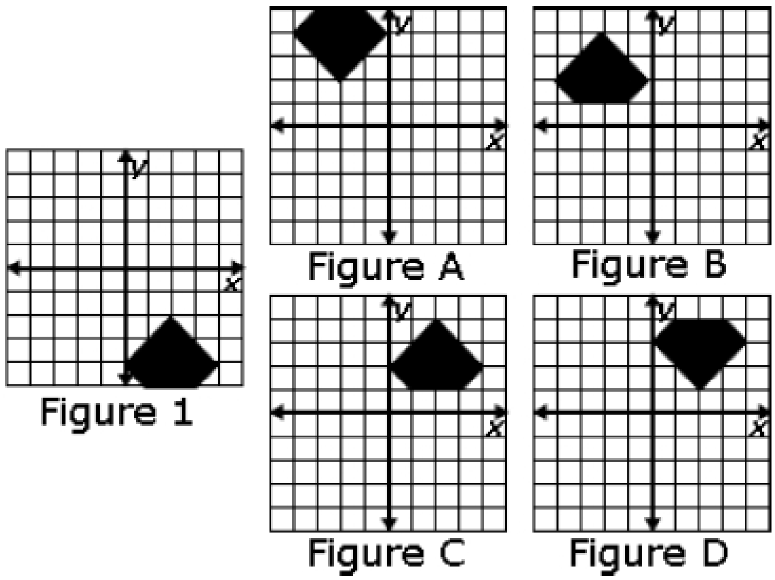
6. Which rotation about its center will carry a regular decagon onto itself?

   A. $54°$
   B. $162°$
   C. $198°$
   D. $252°$

MAFS.912.G-CO.2.6 EOC Practice

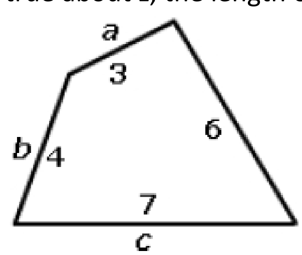
Level 2	Level 3	Level 4	Level 5
determines if a sequence of transformations will result in congruent figures	uses the definition of congruence in terms of rigid motions to determine if two figures are congruent; uses rigid motions to transform figures	explains that two figures are congruent using the definition of congruence based on rigid motions	[intentionally left blank]

1. Figure 1 is reflected about the x-axis and then translated four units left. Which figure results?



A. Figure A
B. Figure B
C. Figure C
D. Figure D

2. It is known that a series of rotations, translations, and reflections superimposes sides a, b, and c of Quadrilateral X onto three sides of Quadrilateral Y. Which is true about z, the length of the fourth side of Quadrilateral Y?



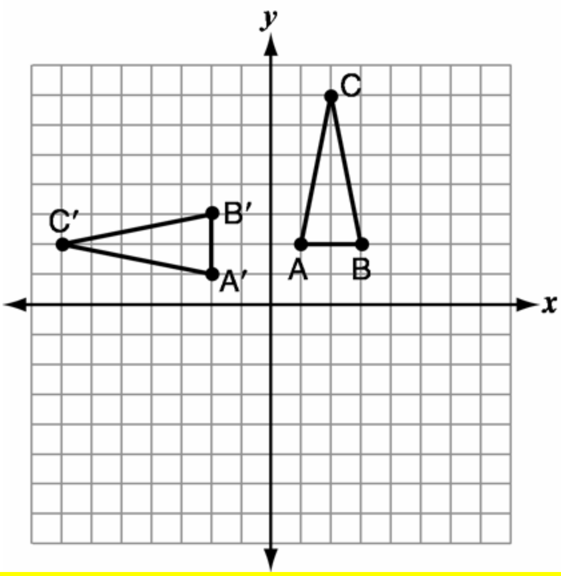
A. It must be equal to 6
B. It can be any number in the range $5 \leq z \leq 7$
C. It can be any number in the range $3 \leq z \leq 8$
D. It can be any number in the range $0 < z < 14$

3. Which transformation will always produce a congruent figure?

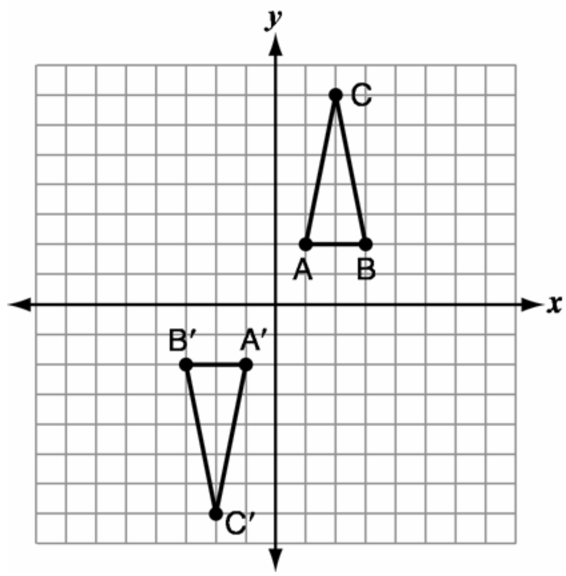
   A. $(x', y') \rightarrow (x + 4, y - 3)$
   B. $(x', y') \rightarrow (2x, y)$
   C. $(x', y') \rightarrow (x + 2, 2y)$
   D. $(x', y') \rightarrow (2x, 2y)$

4. Triangle ABC is rotated 90 degrees clockwise about the origin onto triangle A'B'C'. Which illustration represents the correct position of triangle $A'B'C'$?

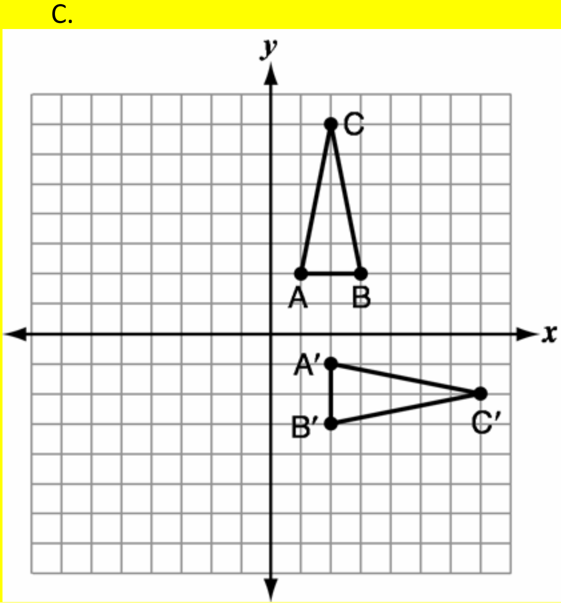
A.



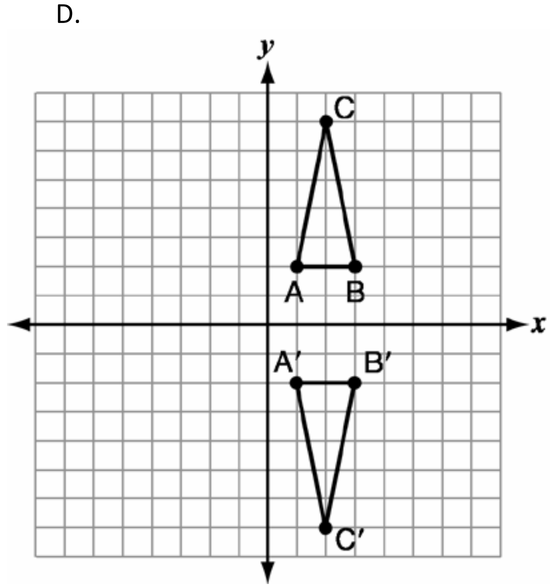
B.



C.



D.



5. The vertices of ΔJKL have coordinates $J(5, 1)$, $K(-2, -3)$, and $L(-4, 1)$. Under which transformation is the image $\Delta J'K'L'$ NOT congruent to ΔJKL?

   A. a translation of two units to the right and two units down
   B. a counterclockwise rotation of 180 degrees around the origin
   C. a reflection over the x −axis
   D. a dilation with a scale factor of 2 and centered at the origin

6. Prove that the triangles with the given vertices are congruent.

   $A(3, 1), B(4, 5), C(2, 3)$

   $D(-1, -3), E(-5, -4), F(-3, -2)$

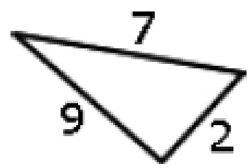
   A. The triangles are congruent because ΔABC can be mapped onto ΔDEF by a rotation: $(x, y) \rightarrow (y, -x)$, followed by a reflection: $(x, y) \rightarrow (x, -y)$.
   B. The triangles are congruent because ΔABC can be mapped onto ΔDEF by a reflection: $(x, y) \rightarrow (-x, y)$, followed by a rotation: $(x, y) \rightarrow (y, -x)$.
   C. The triangles are congruent because ΔABC can be mapped onto ΔDEF by a translation: $(x, y) \rightarrow (x - 4, y)$, followed by another translation: $(x, y) \rightarrow (x, y - 6)$.
   D. The triangles are congruent because ΔABC can be mapped onto ΔDEF by a rotation: $(x, y) \rightarrow (-y, x)$, followed by a reflection: $(x, y) \rightarrow (x, -y)$.

MAFS.912.G-CO.2.7 EOC Practice

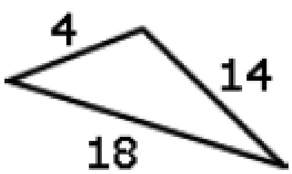
Level 2	Level 3	Level 4	Level 5
identifies corresponding parts of two congruent triangles	shows that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent using the definition of congruence in terms of rigid motions; applies congruence to solve problems; uses rigid motions to show ASA, SAS, SSS, or HL is true for two triangles	shows and explains, using the definition of congruence in terms of rigid motions, the congruence of two triangles; uses algebraic descriptions to describe rigid motion that will show ASA, SAS, SSS, or HL is true for two triangles	justifies steps of a proof given algebraic descriptions of triangles, using the definition of congruence in terms of rigid motions that the triangles are congruent using ASA, SAS, SSS, or HL

1. The triangle below can be subject to reflections, rotations, or translations. With which of the triangles can it coincide after a series of these transformations?

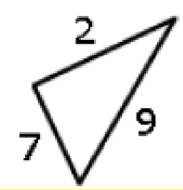
Figures are not necessarily drawn to scale.



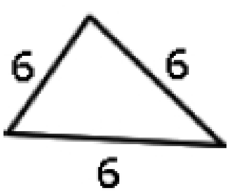
A.



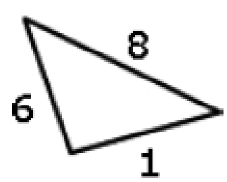
B.



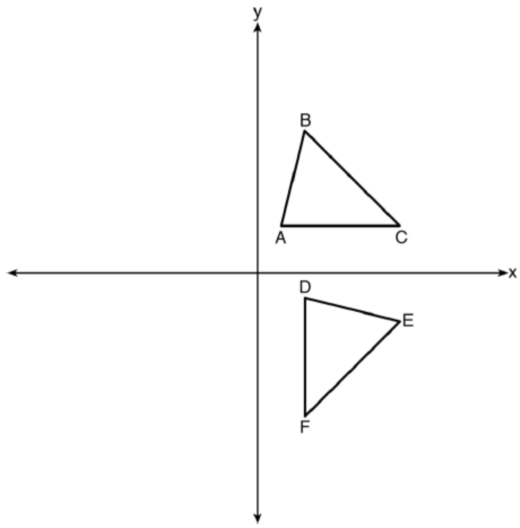
C.



D.



2. The image of ΔABC after a rotation of 90° clockwise about the origin is ΔDEF, as shown below.



Which statement is true?

A. $\overline{BC} \cong \overline{DE}$
B. $\overline{AB} \cong \overline{DF}$
C. $\angle C \cong \angle E$
D. $\angle A \cong \angle D$

3. If $\Delta ABC \cong \Delta DEF$, which segment is congruent to $\overline{AC}$?

A. $\overline{DE}$
B. $\overline{EF}$
C. $\overline{DF}$
D. $\overline{AB}$

4. If $\Delta TRI \cong \Delta ANG$, which of the following congruence statements are true?

- ☐ $\overline{TR} \cong \overline{AN}$
- ☐ $\overline{TI} \cong \overline{AG}$
- ☐ $\overline{RI} \cong \overline{NG}$
- ☐ $\overline{TI} \cong \overline{NA}$
- ☐ $\angle T \cong \angle A$
- ☐ $\angle R \cong \angle N$
- ☐ $\angle I \cong \angle G$
- ☐ $\angle A \cong \angle N$

MAFS.912.G-CO.2.8 EOC Practice

Level 2	Level 3	Level 4	Level 5
identifies corresponding parts of two congruent triangles	shows that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent using the definition of congruence in terms of rigid motions; applies congruence to solve problems; uses rigid motions to show ASA, SAS, SSS, or HL is true for two triangles	shows and explains, using the definition of congruence in terms of rigid motions, the congruence of two triangles; uses algebraic descriptions to describe rigid motion that will show ASA, SAS, SSS, or HL is true for two triangles	justifies steps of a proof given algebraic descriptions of triangles, using the definition of congruence in terms of rigid motions that the triangles are congruent using ASA, SAS, SSS, or HL

1. Given the information regarding triangles ABC and DEF, which statement is true?

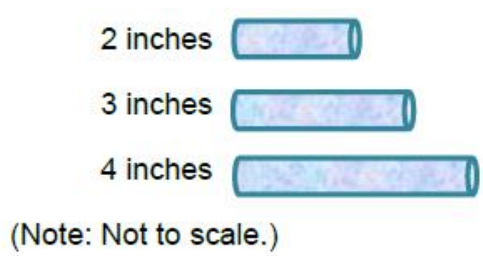
$$\angle A \cong \angle D$$

$$\angle B \cong \angle E$$

$$\overline{BC} \cong \overline{EF}$$

A. The given information matches the SAS criterion; the triangles are congruent.
B. The given information matches the ASA criterion; the triangles are congruent.
C. Angles C and F are also congruent; this must be shown before using the ASA criterion.
D. It cannot be shown that the triangles are necessarily congruent.

2. Zhan cut a drinking straw into three pieces (shown below) to investigate a triangle postulate. He moves the straw pieces to make triangles that have been translated, rotated, and reflected from an original position. The end of one piece is always touching the end of another piece. Which postulate could Zhan be investigating using only these straw pieces and no other tools?



A. The sum of the measures of the interior angles of all triangles is 180°.
B. If three sides of one triangle are congruent to three sides of a second triangle then, the triangles are congruent.
C. The sum of the squares of the lengths of the two shorter sides of a triangle is equal to the square of the length of the longest side of a triangle.
D. If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the triangles are congruent.

3. Consider ΔABC that has been transformed through rigid motions and its image is compared to ΔXYZ. Determine if the given information is sufficient to draw the provided conclusion. Explain your answers.

Given	Conclusion
$\angle A \cong \angle X$ $\angle B \cong \angle Y$ $\angle C \cong \angle Z$	$\Delta ABC \cong \Delta XYZ$

○ TRUE ○ FALSE

Given	Conclusion
$\angle A \cong \angle X$ $\angle B \cong \angle Y$ $\overline{BC} \cong \overline{YZ}$	$\Delta ABC \cong \Delta XYZ$

○ TRUE ○ FALSE

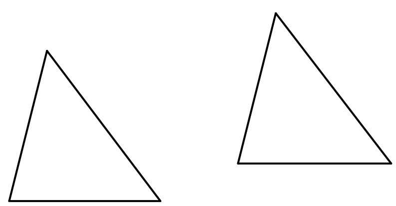
Given	Conclusion
$\angle A \cong \angle X$ $\overline{AB} \cong \overline{XY}$ $\overline{BC} \cong \overline{YZ}$	$\Delta ABC \cong \Delta XYZ$

○ TRUE ○ FALSE

4. For two isosceles right triangles, what is **not** enough information to prove congruence?

A. The lengths of all sides of each triangle.
B. The lengths of the hypotenuses for each triangle.
C. The lengths of a pair of corresponding legs.
D. The measures of the non-right angles in each triangle.

5. For two triangles with identical orientation, what rigid motion is necessary for SAS congruence to be shown?

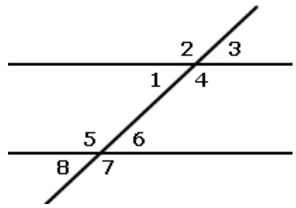


A. Translation
B. Rotation
C. Reflection
D. Dilation

MAFS.912.G-CO.3.9 EOC Practice

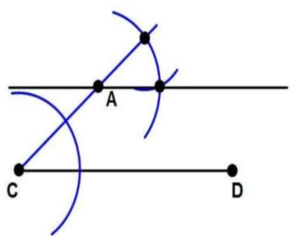
Level 2	Level 3	Level 4	Level 5
uses theorems about parallel lines with one transversal to solve problems; uses the vertical angles theorem to solve problems	completes no more than two steps of a proof using theorems about lines and angles; solves problems using parallel lines with two to three transversals; solves problems about angles using algebra	completes a proof for vertical angles are congruent, alternate interior angles are congruent, and corresponding angles are congruent	creates a proof, given statements and reasons, for points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints

1. Which statements should be used to prove that the measures of angles 1 and 5 sum to 180°?



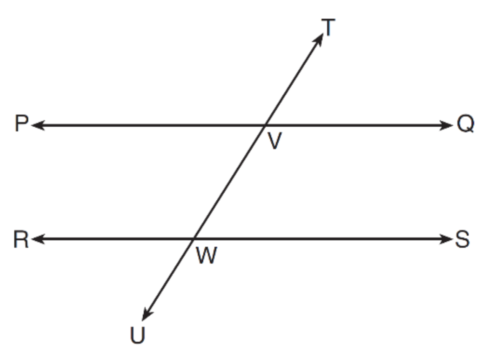
A. Angles 1 and 8 are congruent as corresponding angles; angles 5 and 8 form a linear pair.
B. Angles 1 and 2 form a linear pair; angles 3 and 4 form a linear pair.
C. Angles 5 and 7 are congruent as vertical angles; angles 6 and 8 are congruent as vertical angles.
D. Angles 1 and 3 are congruent as vertical angles; angles 7 and 8 form a linear pair.

2. Which statement justifies why the constructed line passing through the given point A is parallel to $\overline{CD}$?



A. When two lines are each perpendicular to a third line, the lines are parallel.
B. When two lines are each parallel to a third line, the lines are parallel.
C. When two lines are intersected by a transversal and alternate interior angles are congruent, the lines are parallel.
D. When two lines are intersected by a transversal and corresponding angles are congruent, the lines are parallel.

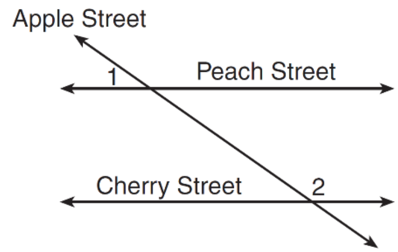
3. In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.



If $m\angle TVQ = 5x - 22$ and $m\angle TVQ = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$, ?

A. 6
B. 16
C. 24
D. 28

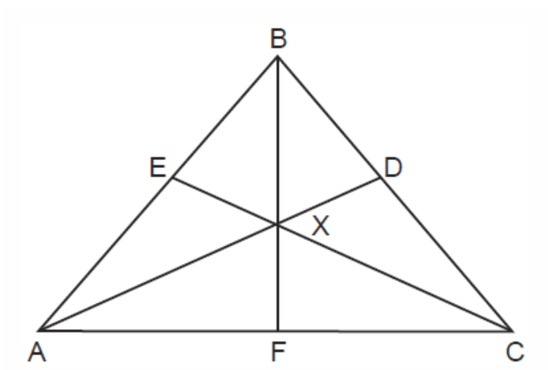
4. Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

A. 9
B. 17
C. 54
D. 70

5. In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



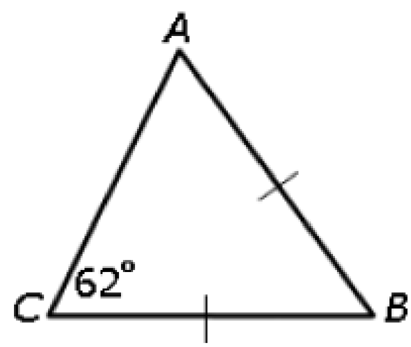
If $m\angle BAC = 50°$, find $m\angle AXC$.

$m\angle AXC = 130°$

MAFS.912.G-CO.3.10 EOC Practice

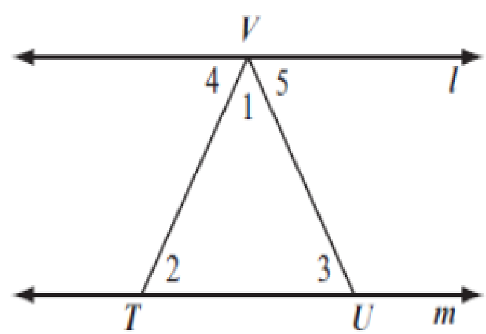
Level 2	Level 3	Level 4	Level 5
uses theorems about interior angles of a triangle, exterior angle of a triangle	completes no more than two steps in a proof using theorems (measures of interior angles of a triangle sum to 180; base angles of isosceles triangles are congruent, the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length) about triangles; solves problems about triangles using algebra; solves problems using the triangle inequality and the Hinge theorem	completes a proof for theorems about triangles; solves problems by applying algebra using the triangle inequality and the Hinge theorem; solves problems for the midsegment of a triangle, concurrency of angle bisectors, and concurrency of perpendicular bisectors	completes proofs using the medians of a triangle meet at a point; solves problems by applying algebra for the midsegment of a triangle, concurrency of angle bisectors, and concurrency of perpendicular bisectors

1. What is the measure of $\angle B$ in the figure below?



A. 62°
B. 58°
C. 59°
D. 56°

2. In this figure, $\boldsymbol{l}||\boldsymbol{m}$. Jessie listed the first two steps in a proof that $\angle\mathbf{1} + \angle\mathbf{2} + \angle\mathbf{3} = \mathbf{180}°$.



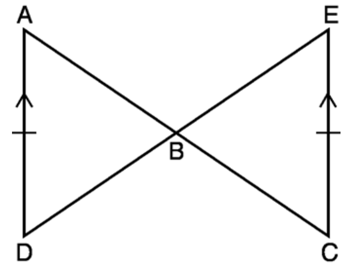
	Step	Justification
1	$\angle 2 \cong \angle 4$	?
2	$\angle 3 \cong \angle 5$	?

Which justification can Jessie give for Steps 1 and 2?

A. Alternate interior angles are congruent.
B. Corresponding angles are congruent.
C. Vertical angles are congruent.
D. Alternate exterior angles are congruent.

3. Given: $\overline{AD} \parallel \overline{EC}$, $\overline{AD} \cong \overline{EC}$

   Prove: $\overline{AB} \cong \overline{CB}$



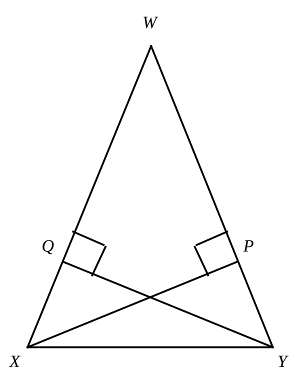
Shown below are the statements and reasons for the proof. They are not in the correct order.

Statement	Reason
I. $\triangle ABD \cong \triangle CBE$	I. AAS
II. $\angle ABD \cong \angle EBC$	II. Vertical angles are congruent.
III. $\overline{AD} \parallel \overline{EC}$, $\overline{AD} \cong \overline{EC}$	III. Given
IV. $\overline{AB} \cong \overline{CB}$	IV. Corresponding parts of congruent triangles are congruent.
V. $\angle DAB \cong \angle ECB$	V. If two parallel lines are cut by a transversal, the alternate interior angles are congruent.

Which of these is the most logical order for the statements and reasons?

A. I, II, III, IV, V
B. III, II, V, I, IV
C. III, II, V, IV, I
D. II, V, III, IV, I

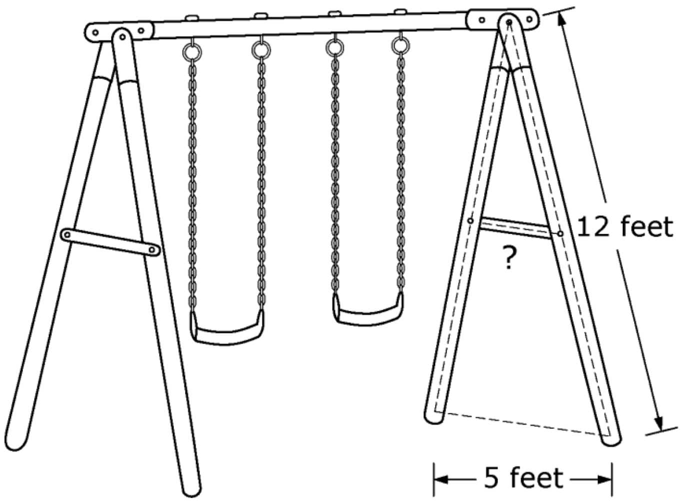
4. $\overline{YQ}$ and $\overline{XP}$ are altitudes to the congruent sides of isosceles triangle WXY.



Keisha is going to prove $\overline{YQ} \cong \overline{XP}$ by showing they are congruent parts of the congruent triangles QXY and PYX.

A. AAS - because triangle WXY is isosceles, its base angles are congruent. Perpendicular lines form right angles, which are congruent; and segment $\overline{XY}$ is shared.
B. SSS - because segment $\overline{QP}$ would be parallel to segment $\overline{XY}$.
C. SSA - because segment $\overline{XY}$ is shared; segments $\overline{XP}$ and $\overline{YQ}$ are altitudes, and WXY is isosceles, so base angles are congruent.
D. ASA - because triangle WXY is isosceles, its base angles are congruent. Segment $\overline{XY}$ is shared; and perpendicular lines form right angles, which are congruent.

5. The figure above represents a swing set. The supports on each side of the swing set are constructed from two 12-foot poles connected by a brace at their midpoint. The distance between the bases of the two poles is 5 feet.

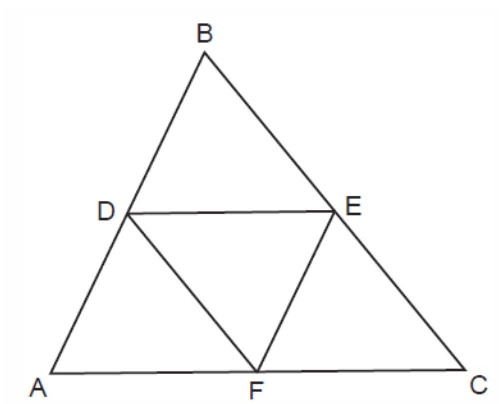


Part A
What is the length of each brace?

2.5 feet

Part B
Which theorem about triangles did you apply to find the solution in Part A?
The segment joining the midpoints of two sides of a triangle is parallel to the third side and half the length.

6. In the diagram below, $\overline{DE}$, $\overline{DF}$, and $\overline{EF}$ are midsegments of ΔABC.



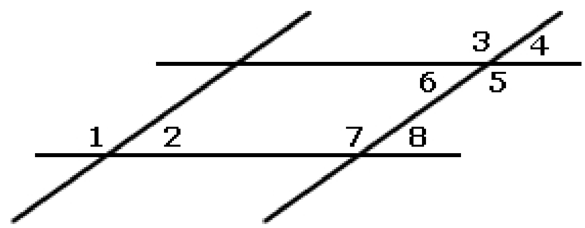
The perimeter of quadrilateral $ADEF$ is equivalent to

A. $AB + BC + AC$
B. $\frac{1}{2}AB + \frac{1}{2}AC$
C. $2AB + 2AC$
D. $AB + AC$

MAFS.912.G-CO.3.11 EOC Practice

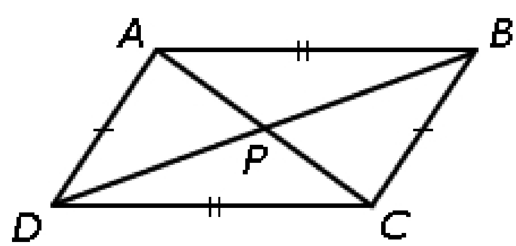
Level 2	Level 3	Level 4	Level 5
uses properties of parallelograms to find numerical values of a missing side or angle or select a true statement about a parallelogram	completes no more than two steps in a proof for opposite sides of a parallelogram are congruent and opposite angles of a parallelogram are congruent; uses theorems about parallelograms to solve problems using algebra	creates proofs to show the diagonals of a parallelogram bisect each other, given statements and reasons	proves that rectangles and rhombuses are parallelograms, given statements and reasons

1. Two pairs of parallel line form a parallelogram. Becki proved that angles 2 and 6 are congruent. She is first used corresponding angles created by a transversal and then alternate interior angles. Which pairs of angles could she use?



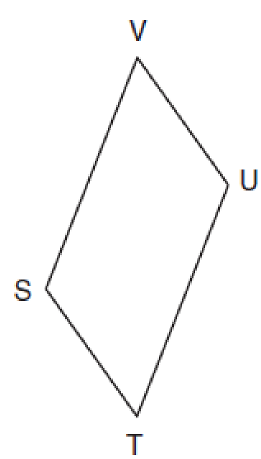
A. 1 and 2 then 5 and 6
B. 4 and 2 then 4 and 6
C. 7 and 2 then 7 and 6
D. 8 and 2 then 8 and 6

2. To prove that diagonals of a parallelogram bisect each other, Xavier first wants to establish that triangles APD and CPB are congruent. Which criterion and elements can he use?



A. SAS: sides AP & PD and CP & PB with the angles in between
B. SAS: sides AD & AP and CB & CP with the angles in between
C. ASA: sides DP and PB with adjacent angles
D. ASA: sides AD and BC with adjacent angles

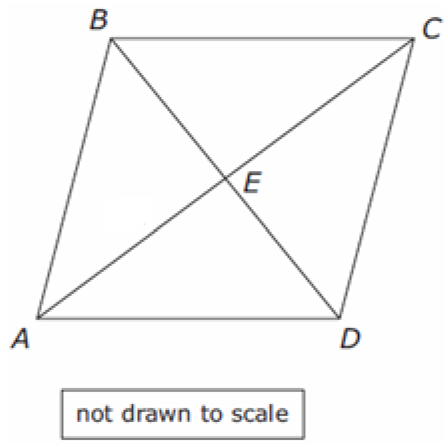
3. In the diagram below of parallelogram $STUV$, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.



What is the length of $\overline{SV}$?

A. 2
B. 4
C. 5
D. 7

4. The figure shows parallelogram $ABCD$ with $AE = 18$.



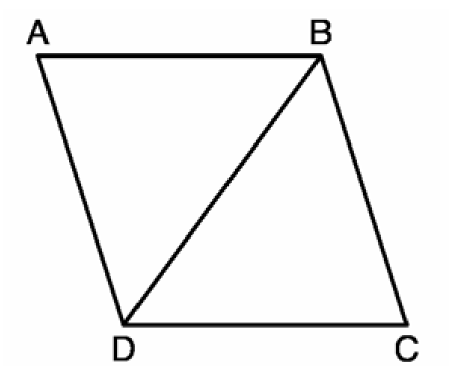
Let $BE = x^2 - 48$ and let $DE = 2x$. What are the lengths of $\overline{BE}$ and $\overline{DE}$?

$\overline{BE} =$ 16

$\overline{DE} =$ 16

5. Ms. Davis gave her students all the steps of the proof below. One step is not needed.
Given: $ABCD \text{ is a parallelogram}$

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

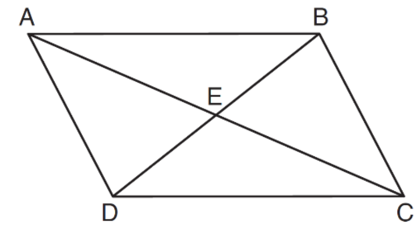


Statements	Reasons
1. ▱ABCD is a parallelogram.	1. Given
2. $\overline{AB} \cong \overline{DC}$ $\overline{AD} \cong \overline{BC}$	2. Opposite sides of a parallelogram are ≅.
3. $\angle A \cong \angle C$	3. Opposite angles of a parallelogram are ≅.
4. $\overline{BD} \cong \overline{BD}$	4. Reflexive property of congruence
5. $\triangle ABD \cong \triangle CDB$	5. SSS

Which step is not necessary to complete this proof?

A. Step 1
B. Step 2
C. Step 3
D. Step 4

6. Given: Quadrilateral $ABCD$ is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at E

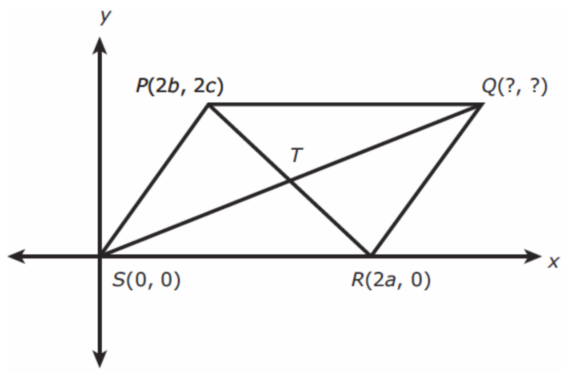


Prove: $\Delta AED \cong \Delta CEB$

Describe a single rigid motion that maps ΔAED onto ΔCEB .

Quadrilateral ABCD is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at E (Given). $\overline{AD} \cong \overline{BC}$ (Opposite sides of a parallelogram are congruent. $\angle AED \cong \angle CEB$ (Vertical angles are congruent). $\overline{BC} \parallel \overline{DA}$ (Definition of parallelogram). $\angle DBC \cong \angle BDA$ (Alternate interior angles are congruent). $\Delta AED \cong \Delta CEB$ (AAS). 180° rotation of ΔAED around point E.

7. The figure shows parallelogram PQRS on a coordinate plane. Diagonals $\overline{SQ}$ and $\overline{PR}$ intersect at point T.



Part A
Find the coordinates of point Q in terms of a, b, and c.

$Q(2a + 2b, 2c)$

Part B
Since $PQRS$ is a parallelogram, $\overline{SQ}$ and $\overline{PR}$ bisect each other. Use the coordinates to verify that $\overline{SQ}$ and $\overline{PR}$ bisect each other.

Student response includes each of the following 2 elements:

- *Student states that the midpoint of SQ must be the same as the midpoint of PR*
- *Provides evidence using appropriate mathematical strategies, reasoning, and/or approaches that verifies $\overline{SQ}$ and $\overline{PR}$ bisect each other*

8. Parallelogram $ABCD$ has coordinates $A(0,7)$ and $C(2,1)$. Which statement would prove that $ABCD$ is a rhombus?

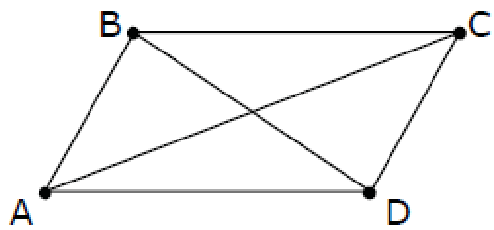
A. The midpoint of $\overline{AC}$ is (1,4).

B. The length of $\overline{BD}$ is $\sqrt{40}$.

C. The slope of $\overline{BD}$ is $\frac{1}{3}$

D. The slope of $\overline{AB}$ is $\frac{1}{3}$

9. Missy is proving the theorem that states that opposite sides of a parallelogram are congruent.



Missy is proving the theorem that states that opposite sides of a parallelogram are congruent.

Given: Quadrilateral ABCD is a parallelogram. Prove: $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$

Missy's incomplete proof is shown.

	Statement		Reason
1.	Quadrilateral ABCD is a parallelogram.	1.	given
2.	$\overline{AB} \parallel \overline{CD}$; $\overline{BC} \parallel \overline{DA}$	2.	definition of parallelogram
3.	**?**	3.	**?**
4.	$\overline{AC} \cong \overline{AC}$	4.	reflexive property
5.	$\Delta ABC \cong \Delta CDA$	5.	angle-side-angle congruence postulate
6.	$\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$	6.	Corresponding parts of congruent triangles are congruent (CPCTC).

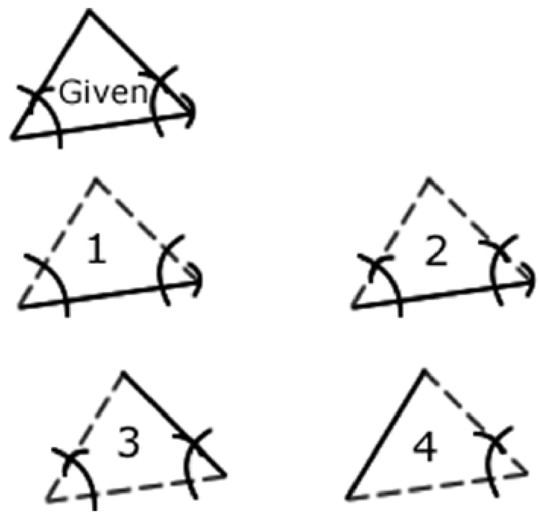
Which statement and reason should Missy insert into the chart as step 3 to complete the proof?

A. $\overline{BD} \cong \overline{BD}$; reflexive property
B. $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$; reflexive property
C. $\angle ABD \cong \angle CDB$ and $\angle ADB \cong \angle CBD$; When parallel lines are cut by a transversal, alternate interior angles are congruent.
D. $\angle BAC \cong \angle DCA$ and $\angle BCA \cong \angle DAC$; When parallel lines are cut by a transversal, alternate interior angles are congruent.

MAFS.912.G-CO.4.12 EOC Practice

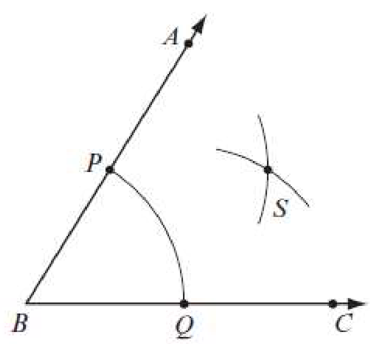
Level 2	Level 3	Level 4	Level 5
chooses a visual or written step in a construction	identifies, sequences, or reorders steps in a construction: copying a segment, copying an angle, bisecting a segment, bisecting an angle, constructing perpendicular lines, including the perpendicular bisector of a line segment, and constructing a line parallel to a given line through a point not on the line	identifies sequences or reorders steps in a construction of an equilateral triangle, a square, and a regular hexagon inscribed in a circle	explains steps in a construction

1. Which triangle was constructed congruent to the given triangle?



A. Triangle 1
B. Triangle 2
C. Triangle 3
D. Triangle 4

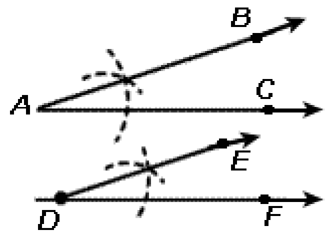
2. A student used a compass and a straightedge to bisect ∠ABC in this figure.



Which statement BEST describes point S?

A. Point S is located such that SC = PQ.
B. Point S is located such that SA = PQ.
C. Point S is located such that PS = BQ.
D. Point S is located such that QS = PS.

3. What is the first step in constructing congruent angles?

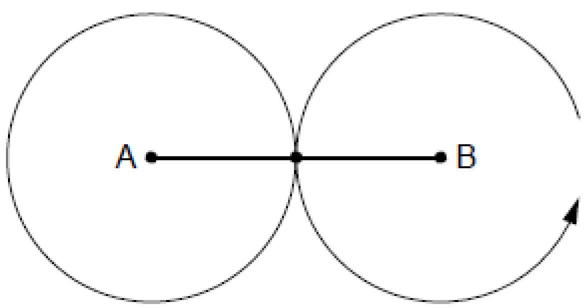


A. Draw ray DF.
B. From point A, draw an arc that intersects the sides of the angle at point B and C.
C. From point D, draw an arc that intersects the sides of the angle at point E and F.
D. From points A and D, draw equal arcs that intersects the rays AC and DF.

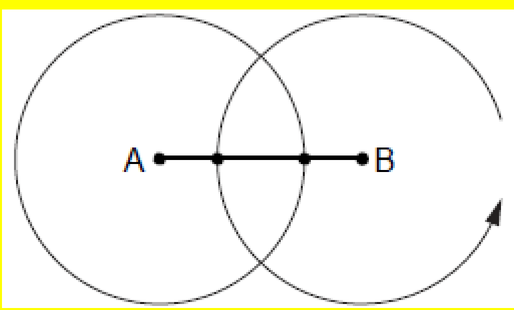
4. Melanie wants to construct the perpendicular bisector of line segment AB using a compass and straightedge.

Which diagram shows the first step(s) of the construction?

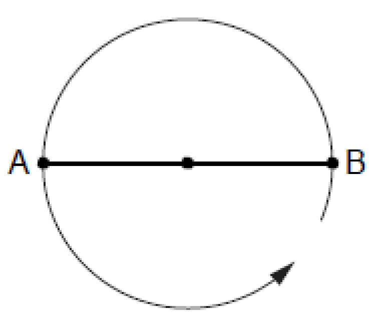
A.



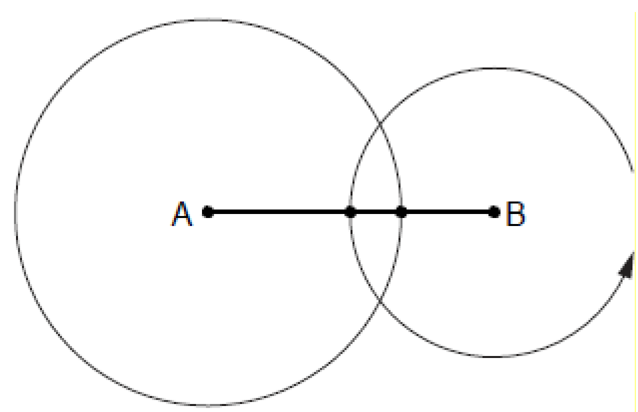
B.



C.



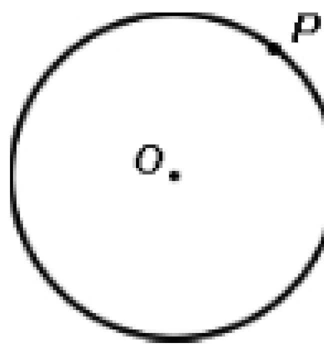
D.



MAFS.912.G-CO.4.13 EOC Practice

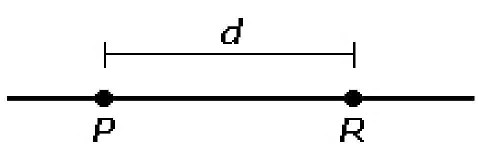
Level 2	Level 3	Level 4	Level 5
chooses a visual or written step in a construction	identifies, sequences, or reorders steps in a construction: copying a segment, copying an angle, bisecting a segment, bisecting an angle, constructing perpendicular lines, including the perpendicular bisector of a line segment, and constructing a line parallel to a given line through a point not on the line	identifies sequences or reorders steps in a construction of an equilateral triangle, a square, and a regular hexagon inscribed in a circle	explains steps in a construction

1. The radius of circle O is r. A circle with the same radius drawn around P intersects circle O at point R. What is the measure of angle ROP?



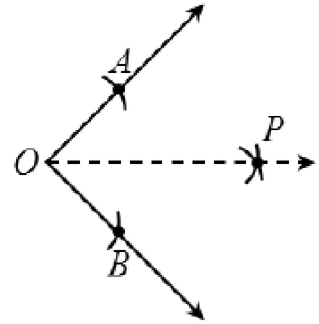
A. 30°
B. 60°
C. 90°
D. 120°

2. Carol is constructing an equilateral triangle with P and R being two of the vertices. She is going to use a compass to draw circles around P and R. What should the radius of the circles be?



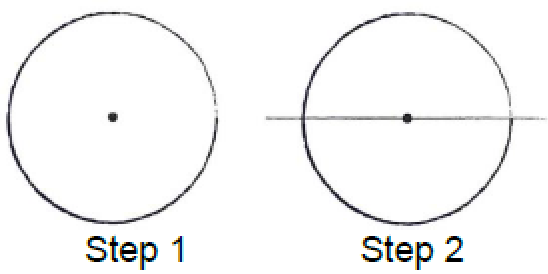
A. d
B. $2d$
C. $\frac{d}{2}$
D. d^2

3. The figure below shows the construction of the angle bisector of $\angle AOB$ using a compass. Which of the following statements must always be true in the construction of the angle bisector? Select **Yes** or **No** for each statement.



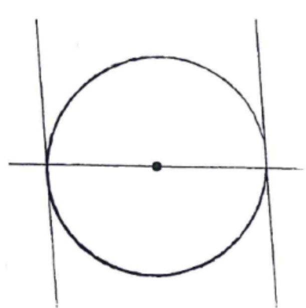
$OA = OB$	○ YES	○ NO
$AP = BP$	○ YES	○ NO
$AB = BP$	○ YES	○ NO
$OB = BP$	○ YES	○ NO

4. Daya is drawing a square inscribed in a circle using a compass and a straightedge. Her first two steps are shown.

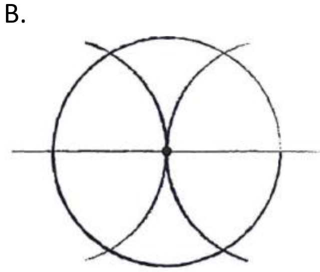


Which is the best step for Daya to do next?

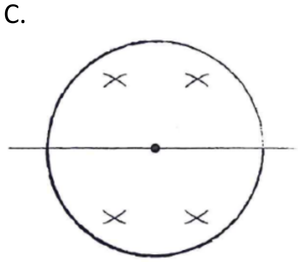
A.



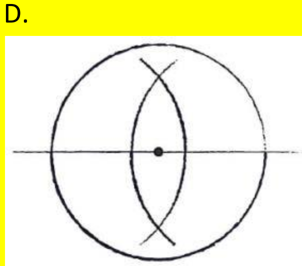
B.



C.



D.



5. Carolina wanted to construct a polygon inscribed in a circle by paper folding. She completed the following steps:
    - Start with a paper circle. Fold it in half. Make a crease.
    - Take the half circle and fold it in thirds. Crease along the sides of the thirds.
    - Open the paper. Mark the intersection points of the creases with the circle.
    - Connect adjacent intersection points on the circle with segments.

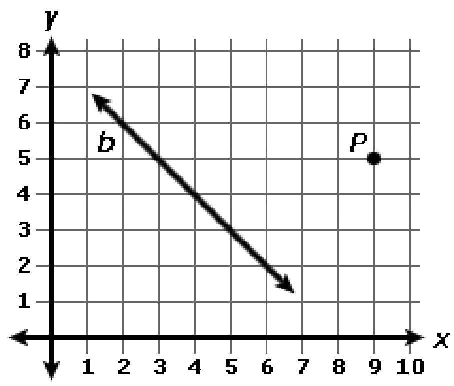
    Which polygon was Carolina most likely trying to construct?

    A. Regular nonagon
    B. Regular octagon
    C. Regular hexagon
    D. Regular pentagon

MAFS.912.G-SRT.1.1 EOC Practice

Level 2	Level 3	Level 4	Level 5
identifies the scale factors of dilations	chooses the properties of dilations when a dilation is presented on a coordinate plane, as a set of ordered pairs, as a diagram, or as a narrative; properties are: a dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged; the dilation of a line segment is longer or shorter in the ratio given by the scale factor	explains why a dilation takes a line not passing through the center of dilation to a parallel line and leaves a line passing through the center unchanged or that the dilation of a line segment is longer or shorter in ratio given by the scale factor	explains whether a dilation presented on a coordinate plane, as a set of ordered pairs, as a diagram, or as a narrative correctly verifies the properties of dilations

1. Line b is defined by the equation y = 8 - x. If line b undergoes a dilation with a scale factor of 0.5 and center P, which equation will define the image of the line?



A. $y = 4 - x$
B. $y = 5 - x$
C. $y = 8 - x$
D. $y = 11 - x$

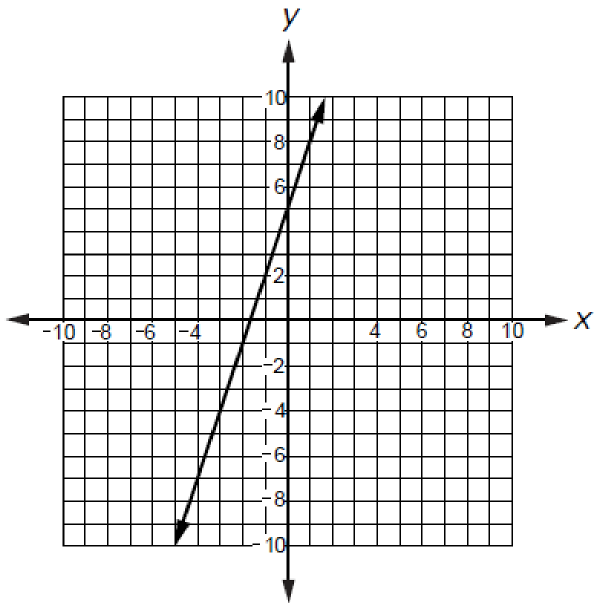
2. GH = 1. A dilation with center H and a scale factor of 0.5 is applied. What will be the length of the image of the segment GH?

A. 0
B. 0.5
C. 1
D. 2

3. The vertices of square $ABCD$ are $A(3,1), B(3,-1), C(5,-1)$, and $D(5,1)$. This square is dilated so that A' is at $(3,1)$ and C' is at $(8,-4)$. What are the coordinates of D'?

A. $(6,-4)$
B. $(6,-4)$
C. $(8,1)$
D. $(8,4)$

4. Rosa graphs the line $y = 3x + 5$. Then she dilates the line by a factor of $\frac{1}{5}$ with (0, 7) as the center of dilation.



Which statement best describes the result of the dilation?

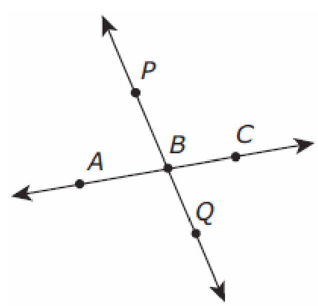
A. The result is a different line $\frac{1}{5}$ the size of the original line.

B. The result is a different line with a slope of 3.

C. The result is a different line with a slope of $-\frac{1}{3}$.

D. The result is the same line.

5. The figure shows line AC and line PQ intersecting at point B. Lines $A'C'$ and $P'Q'$ will be the images of lines AC and PQ, respectively, under a dilation with center P and scale factor 2.



Which statement about the image of lines AC and PQ would be true under the dilation?

A. Line $A'C'$ will be parallel to line AC, and line $P'Q'$ will be parallel to line PQ.

B. Line $A'C'$ will be parallel to line AC, and line $P'Q'$ will be the same line as line PQ.

C. Line $A'C'$ will be perpendicular to line AC, and line $P'Q'$ will be parallel to line PQ.

D. Line $A'C'$ will be perpendicular to line AC, and line $P'Q'$ will be the same line as line PQ.

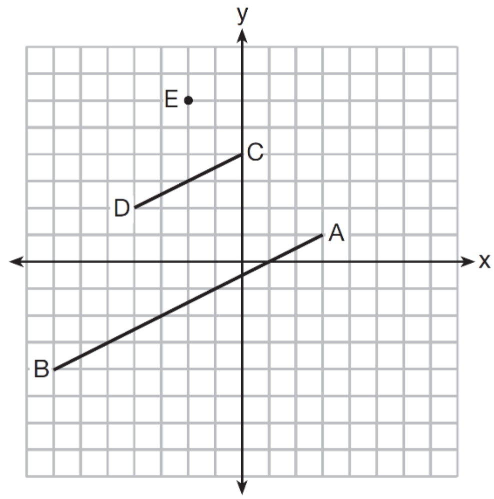
6. A line that passes through the points whose coordinates are $(1,1)$ and $(5,7)$ is dilated by a scale factor of 3 and centered at the origin. The image of the line

   A. is perpendicular to the original line
   B. is parallel to the original line
   C. passes through the origin
   D. is the original line

7. In the diagram below, $\overline{CD}$ is the image of $\overline{AB}$ after a dilation of scale factor k with center E.

   Which ratio is equal to the scale factor k of the dilation?

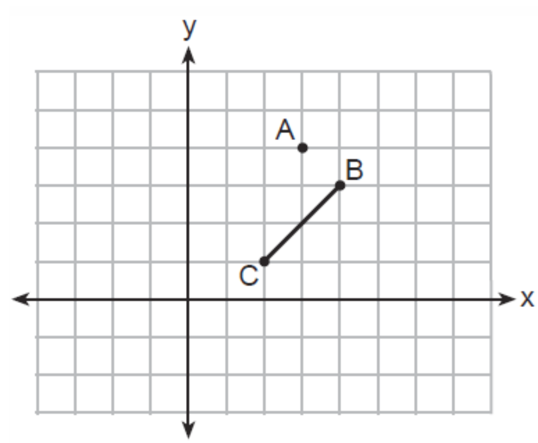
   A. $\frac{EC}{EA}$
   B. $\frac{BA}{EA}$
   C. $\frac{EA}{BA}$
   D. $\frac{EA}{EC}$



8. On the graph below, point $A(3,4)$ and $\overline{BC}$ with coordinates $B(4,3)$ and $C(2,1)$ are graphed.

   What are the coordinates of B' and C' after $\overline{BC}$ undergoes a dilation centered at point A with a scale factor of 2?

   A. $B'(5,2)$ and $C'(1,-2)$
   B. $B'(6,1)$ and $C'(0,-1)$
   C. $B'(5,0)$ and $C'(1,-2)$
   D. $B'(5,2)$ and $C'(3,0)$



FSA Geometry EOC Review

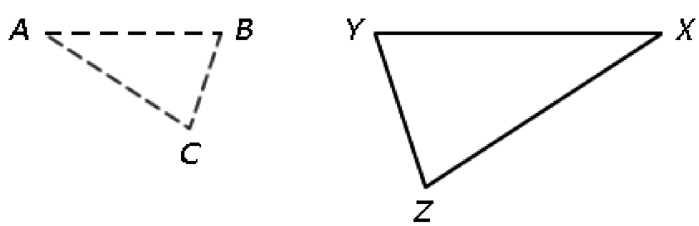
MAFS.912.G-SRT.1.2 EOC Practice

Level 2	Level 3	Level 4	Level 5
determines if two given figures are similar	uses the definition of similarity in terms of similarity transformations to decide if two figures are similar; determines if given information is sufficient to determine similarity	shows that corresponding angles of two similar figures are congruent and that their corresponding sides are proportional	explains using the definition of similarity in terms of similarity transformations that corresponding angles of two figures are congruent and that corresponding sides of two figures are proportional

1. When two triangles are considered similar but not congruent?

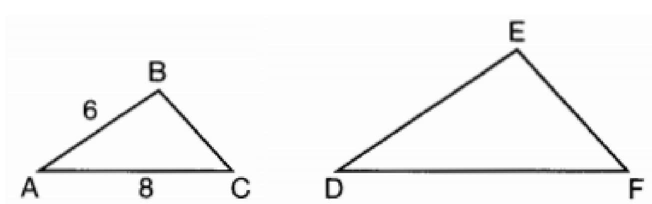
   A. The distance between corresponding vertices are equal.
   B. The distance between corresponding vertices are proportionate.
   C. The vertices are reflected across the x-axis.
   D. Each of the vertices are shifted up by the same amount.

2. Triangle ABC was reflected and dilated so that it coincides with triangle XYZ. How did this transformation affect the sides and angles of triangle ABC?



   A. The side lengths and angle measure were multiplied by $\frac{XY}{AB}$
   B. The side lengths were multiplied by $\frac{XY}{AB}$, while the angle measures were preserved
   C. The angle measures were multiplied by $\frac{XY}{AB}$, while the side lengths were preserved
   D. The angle measures and side lengths were preserved

3. In the diagram below, $\Delta ABC \sim \Delta DEF$.



   If $AB = 6$ and $AC = 8$, which statement will justify similarity by SAS?

   A. $DE = 9$, $DF = 12$, and $\angle A \cong \angle D$
   B. $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$
   C. $DE = 36$, $DF = 64$, and $\angle C \cong \angle LF$
   D. $DE = 15$, $DF = 20$, and $\angle C \cong \angle LF$

4. Kelly dilates triangle ABC using point P as the center of dilation and creates triangle $A'B'C'$.
By comparing the slopes of AC and CB and $A'C'$ and $C'B'$, Kelly found that $\angle ACB$ and $\angle A'C'B'$ are right angles.

Which set of calculations could Kelly use to prove ΔABC is similar to $\Delta A'B'C'$?

A.

$$\text{slope AB} = \frac{7-(-7)}{2-(-5)} = \frac{14}{7} = 2$$

$$\text{slope A'B'} = \frac{7-3}{-3-(-5)} = \frac{4}{2} = 2$$

B.

$$AB^2 = 7^2 + 14^2$$

$$A'B'^2 = 2^2 + 4^2$$

C.

$$\tan\angle ABC = \frac{AC}{BC} = \frac{7}{14}$$

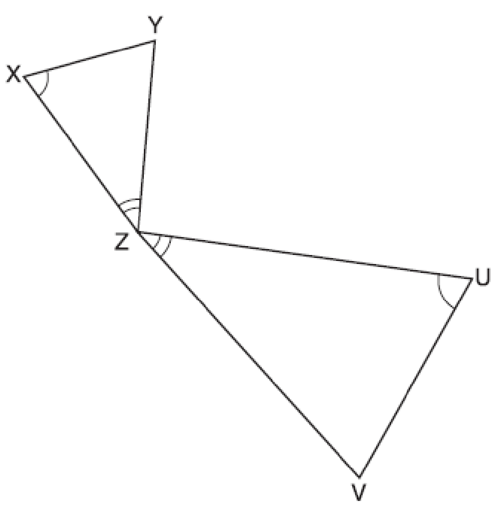
$$\tan\angle A'B'C' = \frac{A'C'}{B'C'} = \frac{2}{4}$$

D.

$$\angle ABC + \angle BCA + \angle CAB = 180^\circ$$

$$\angle A'B'C' + \angle B'C'A' + \angle C'A'B' = 180^\circ$$

5. In the diagram below, triangles XYZ and UVZ are drawn such that $\angle X \cong \angle U$ and $\angle XZY \cong \angle UZV$.



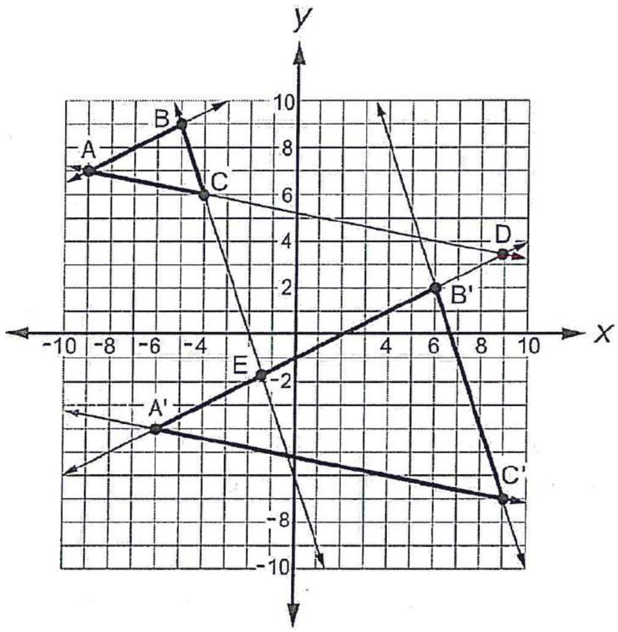
Describe a sequence of similarity transformations that shows ΔXYZ is similar to ΔUVZ.

Check student work.

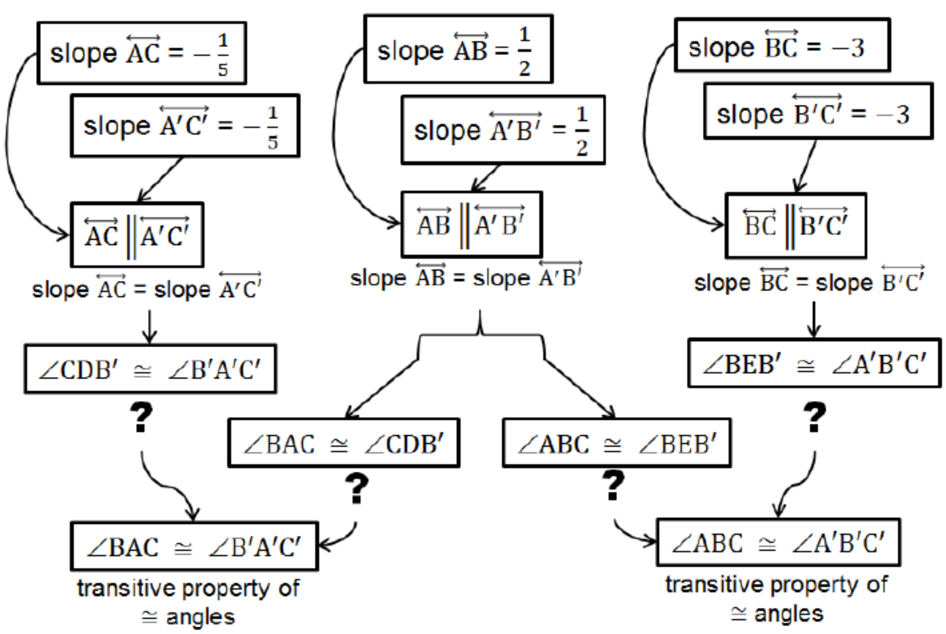
MAFS.912.G-SRT.1.3 EOC Practice

Level 2	Level 3	Level 4	Level 5
identifies that two triangles are similar using the AA criterion	establishes the AA criterion for two triangles to be similar by using the properties of similarity transformations	proves that two triangles are similar if two angles of one triangle are congruent to two angles of the other triangle, using the properties of similarity transformations; uses triangle similarity to prove theorems about triangles	proves the Pythagorean theorem using similarity

1. Kamal dilates triangle ABC to get triangle A′B′C′. He knows that the triangles are similar because of the definition of similarity transformations. He wants to demonstrate the angle-angle similarity postulate by proving ∠BAC ≅∠B′A′C′ and ∠ ABC ≅ ∠A′B′C′.



Kamal makes this incomplete flow chart proof.

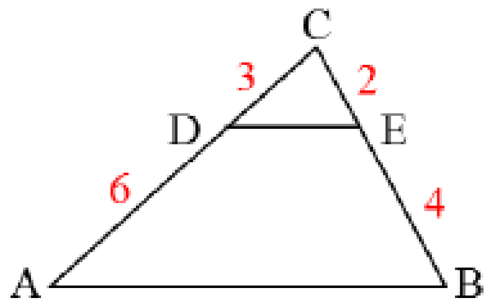


What reason should Kamal add at all of the question marks in order to complete the proof?

A. Two non-vertical lines have the same slope if and only if they are parallel.
B. Angles supplementary to the same angle or to congruent angles are congruent.
C. If two parallel lines are cut by a transversal, then each pair of corresponding angles is congruent.
D. If two parallel lines are cut by a transversal, then each pair of alternate interior angles is congruent.

2. Given: $AD = 6;\ DC = 3;\ BE = 4;\ and\ EC = 2$

Prove: $\Delta CDE \sim \Delta CAB$

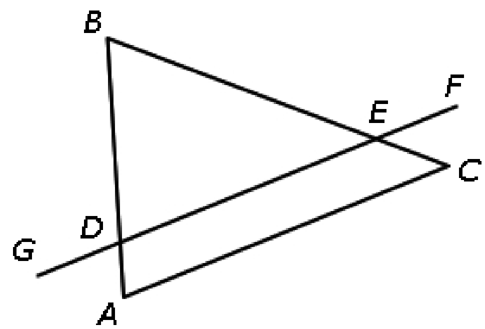


	Statements	Reasons
1.		Given
2.	$CA = CD + DA$ $CB = CE + EB$	*Segment Addition Postulate*
3.	$\frac{CA}{CD} = \frac{9}{3} = 3\,;\frac{CB}{CE} = \frac{6}{2} = 3$	*Division Property*
4.	$\frac{CA}{CD} = \frac{CB}{CE}$	Transitive Property
5.	$\angle DCE \cong \angle ACB$	*Reflexive Property*
6.	$\Delta CDE \sim \Delta CAB$	*SAS Similarity Theorem*

MAFS.912.G-SRT.2.4 EOC Practice

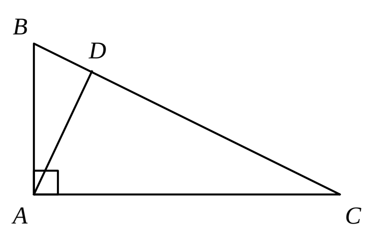
Level 2	Level 3	Level 4	Level 5
identifies that two triangles are similar using the AA criterion	establishes the AA criterion for two triangles to be similar by using the properties of similarity transformations	proves that two triangles are similar if two angles of one triangle are congruent to two angles of the other triangle, using the properties of similarity transformations; uses triangle similarity to prove theorems about triangles	proves the Pythagorean theorem using similarity

1. Lines AC and FG are parallel. Which statement should be used to prove that triangles ABC and DBE are similar?



A. Angles BDE and BCA are congruent as alternate interior angles.
B. Angles BAC and BEF are congruent as corresponding angles.
C. Angles BED and BCA are congruent as corresponding angles.
D. Angles BDG and BEF are congruent as alternate exterior angles.

2. A diagram from a proof of the Pythagorean Theorem is shown. Which statement would NOT be used in the proof?



A. $(AB)^2 + (AC)^2 = (BC)[(BD) + (DC)] \Rightarrow (AB)^2 + (AC)^2 = (BC)$

B. $\Delta BAC \sim \Delta BDA \sim \Delta ADC$

C. $\frac{AB}{BC} = \frac{BD}{AB}$ and $\frac{AC}{BC} = \frac{DC}{AC}$

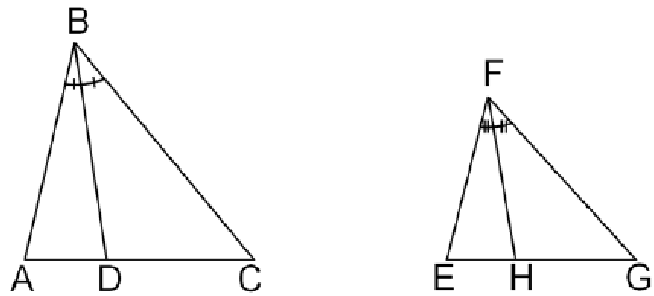
D. ΔABC is a right triangle with an altitude $\overline{AD}$.

3. Ethan is proving the theorem that states that if two triangles are similar, then the measures of the corresponding angle bisectors are proportional to the measures of the corresponding sides.

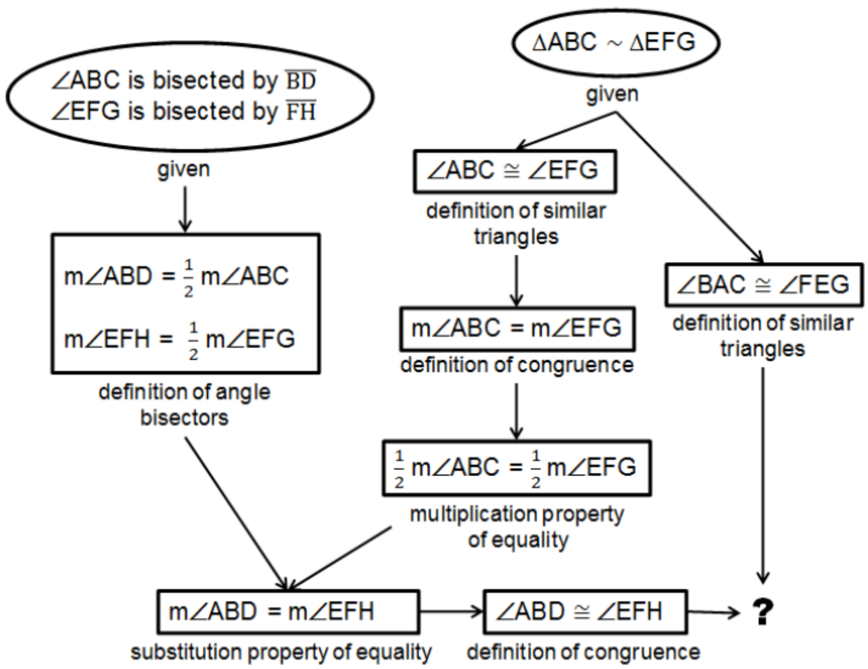
Given: $\Delta ABC \sim \Delta EFG$.

$\overline{BD}$ bisects $\angle ABC$, and $\overline{FH}$ bisects $\angle EFG$.

Prove: $\frac{AB}{EF} = \frac{BD}{FH}$



Ethan's incomplete flow chart proof is shown.



Which statement and reason should Ethan add at the question mark to best continue the proof?

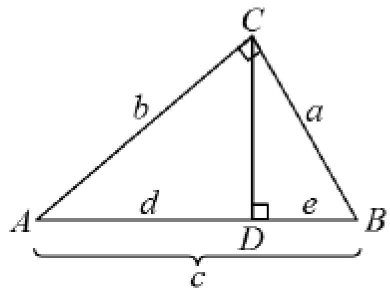
A. $\Delta ABD \sim \Delta EFH$; AA similarity

B. $\angle BCA \cong \angle FGE$; definition of similar triangles

C. $\frac{AB}{BC} = \frac{EF}{GH}$; definition of similar triangles

D. $m\angle ADB + m\angle ABD + m\angle BAD = 180°$; $m\angle EFH + m\angle EHF + m\angle FEH = 180°$; Angle Sum Theorem

4. In the diagram, ΔABC is a right triangle with right angle C, and $\overline{CD}$ is an altitude of ΔABC. Use the fact that $\Delta ABC \sim \Delta ACD \sim \Delta CBD$ to prove $a^2 + b^2 = c^2$

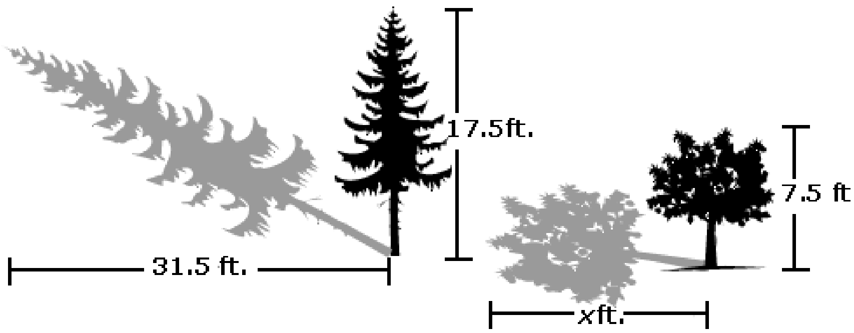


Statements	Reasons

MAFS.912.G-SRT.2.5 EOC Practice

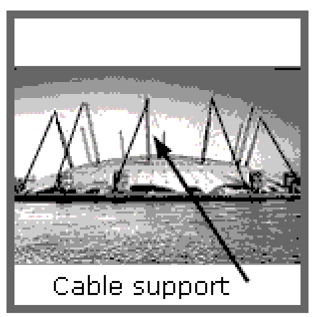
Level 2	Level 3	Level 4	Level 5
finds measures of sides and angles of congruent and similar triangles when given a diagram	solves problems involving triangles, using congruence and similarity criteria; provides justifications about relationships using congruence and similarity criteria	completes proofs about relationships in geometric figures by using congruence and similarity criteria for triangles	proves conjectures about congruence or similarity in geometric figures, using congruence and similarity criteria

1. Given the diagram below, what is the value of x?



A. 13.5
B. 14.6
C. 15.5
D. 16.6

2. A scale model of the Millennium Dome in Greenwich, England, was constructed on a scale of 100 meters to 1 foot. The cable supports are 50 meters high and form a triangle with the cables. How high are the cable supports on the scale model that was built?



A. 0.5 foot
B. 1 foot
C. 1.5 feet
D. 2 feet

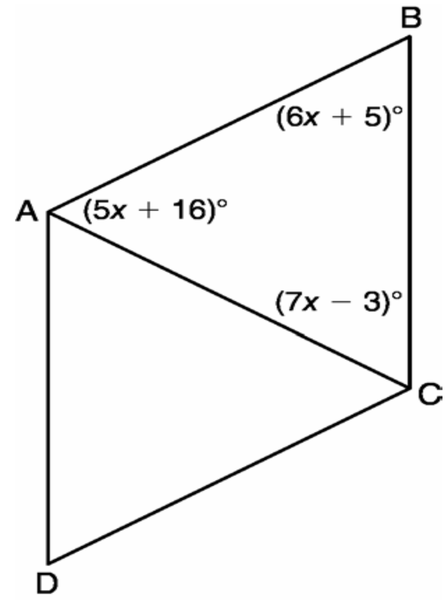
3. Hector knows two angles in triangle A are congruent to two angles in triangle B. What else does Hector need to know to prove that triangles A and B are similar?

    A. Hector does not need to know anything else about triangles A and B.
    B. Hector needs to know the length of any corresponding side in both triangles.
    C. Hector needs to know all three angles in triangle A are congruent to the corresponding angles in triangle B.
    D. Hector needs to know the length of the side between the corresponding angles on each triangle.

4. Figure ABCD, to the right, is a parallelogram.

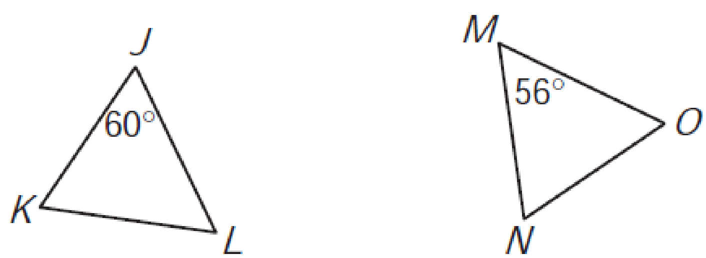
    What is the measure of $\angle ACD$?

    A. 59°
    B. 60°
    C. 61°
    D. 71°



(Not drawn to scale)

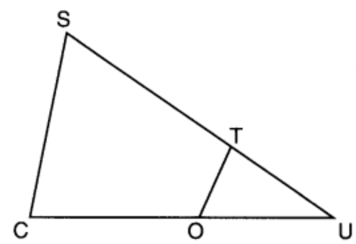
5. In the diagram below, $\Delta JKL \cong \Delta ONM$.



Based on the angle measures in the diagram, what is the measure, in degrees, of $\angle N$? Enter your answer in the box.

64

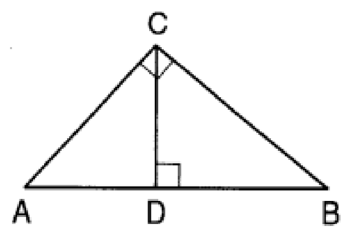
6. In ΔSCU shown below, points T and 0 are on $\overline{SU}$ and $\overline{CU}$, respectively. Segment $\overline{OT}$ is drawn so that $\angle C \cong \angle OTU$.



If $TU = 4$, $OU = 5$, and $OC = 7$, what is the length of $\overline{ST}$?

A. 5.6
B. 8.75
C. 11
D. 15

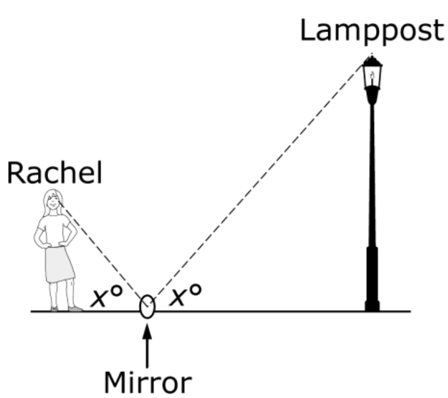
7. In the diagram below, $\overline{CD}$ is the altitude drawn to the hypotenuse $\overline{AB}$ of right triangle ABC.



Which lengths would not produce an altitude that measures $6\sqrt{2}$?

A. $AD = 2$ and $DB = 36$
B. $AD = 3$ and $AB = 24$
C. $AD = 6$ and $DB = 12$
D. $AD = 8$ and $AB = 17$

8. To find the height of a lamppost at a park, Rachel placed a mirror on the ground 20 feet from the base of the lamppost. She then stepped back 4 feet so that she could see the top of the lamp post in the center of the mirror. Rachel's eyes are 5 feet 6 inches above the ground. What is the height, in feet, of the lamppost?

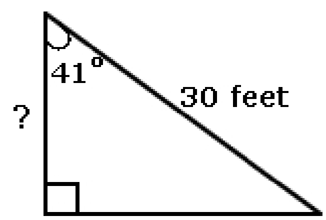


27. 5 feet

MAFS.912.G-SRT.3.8 EOC Practice

Level 2	Level 3	Level 4	Level 5
calculates unknown side lengths using the Pythagorean theorem given a picture of a right triangle; recognizes the sine, cosine, or tangent ratio when given a picture of a right triangle with two sides and an angle labeled	solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem in applied problems; uses the relationship between sine and cosine of complementary angles	assimilates that the ratio of two sides in one triangle is equal to the ratio of the corresponding two sides of all other similar triangles leading to definitions of trigonometric ratios for acute angles; explains the relationship between the sine and cosine of complementary angles; solves for missing angles of right triangles using sine, cosine, and tangent	uses the modeling context to solve problems that require more than one trigonometric ratio and/or the Pythagorean theorem; solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem when side lengths and/or angles are given using variables

1. A 30-foot long escalator forms a 41° angle at the second floor. Which is the closest height of the first floor?



A. 20 feet
B. 22.5 feet
C. 24.5 feet
D. 26 feet

2. Jane and Mark each build ramps to jump their remote-controlled cars.
Both ramps are right triangles when viewed from the side. The incline of Jane's ramp makes a 30-degree angle with the ground, and the length of the inclined ramp is 14 inches. The incline of Mark's ramp makes a 45-degree angle with the ground, and the length of the inclined ramp is 10 inches.

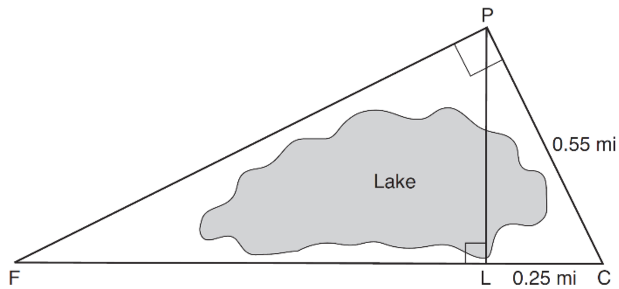
Part A
What is the horizontal length of the base of Jane's ramp and the base of Mark's ramp? Enter your answer in the box.

12.12 and 7.07

Part B
Which car is launched from the highest point? Enter your answer in the box.

Mark's

3. In the diagram below, the line of sight from the park ranger station, P, to the lifeguard chair, L, on the beach of a lake is perpendicular to the path joining the campground, C, and the first aid station, F. The campground is 0.25 mile from the lifeguard chair. The straight paths from both the campground and first aid station to the park ranger station are perpendicular.

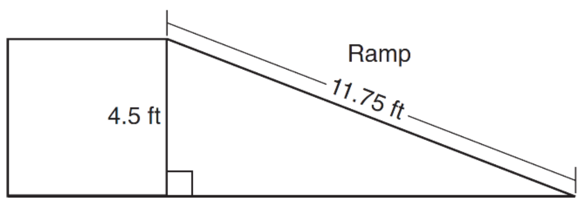


If the path from the park ranger station to the campground is 0.55 mile, determine and state, to the nearest hundredth of a mile, the distance between the park ranger station and the lifeguard chair. Gerald believes the distance from the first aid station to the campground is at least 1.5 miles. Is Gerald correct? Justify your answer.

$x = \sqrt{.55^2 - .25^2} \cong 0.49$ No, $.49^2 = .25y$ $.9604 + .25 < 1.5$

$.9604 = y$

4. The diagram below shows a ramp connecting the ground to a loading platform 4.5 feet above the ground. The ramp measures 11.75 feet from the ground to the top of the loading platform.



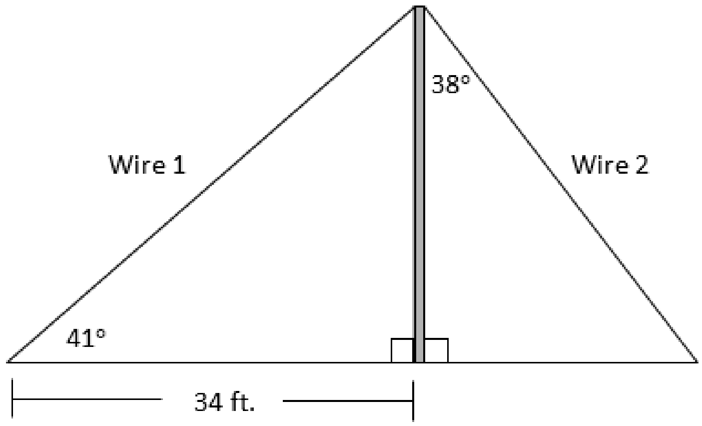
Determine and state, to the nearest degree, the angle of elevation formed by the ramp and the ground.

23°

5. In ΔABC, the complement of $\angle B$ is $\angle A$. Which statement is always true?

A. $tan\ \angle A = tan\ \angle B$
B. $sin\ \angle A = sin\ \angle LB$
C. $cos\angle A = tan\ \angle B$
D. $sin\ \angle A = cos\ \angle B$

6. In the figure below, a pole has two wires attached to it, one on each side, forming two right triangles.



Based on the given information, answer the questions below.
How tall is the pole? Enter your answer in the box.

$29.6\ ft.$

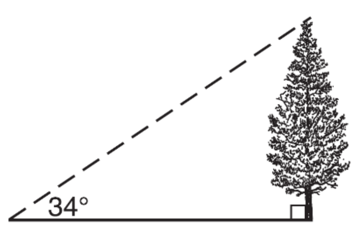
How far from the base of the pole does Wire 2 attach to the ground? Enter your answer in the box.

$23.1\ ft.$

How long is Wire 1? Enter your answer in the box.

$45.1\ ft.$

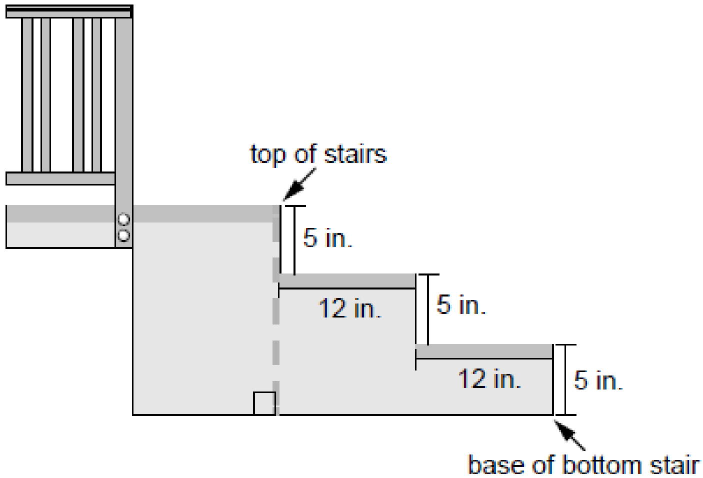
7. As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is 34°.



If the point is 20 feet from the base of the tree, what is the height of the tree, to the nearest tenth of a foot?

A. 29.7
B. 16.6
C. 13.5
D. 11.2

8. Leah needs to add a wheelchair ramp over her stairs. The ramp will start at the top of the stairs. Each stair makes a right angle with each riser.



Part A

The ramp must have a maximum slope of $\frac{1}{12}$. To the nearest hundredth of a foot, what is the shortest length of ramp that Leah can build and not exceed the maximum slope? Enter your answer in the box.

$15.05\ ft.$

Part B

Leah decides to build a ramp that starts at the top of the stairs and ends 18 feet from the base of the bottom stair. To the nearest hundredth of a foot, what is the length of the ramp? Enter your answer in the box.

$20.04\ ft.$

Part C

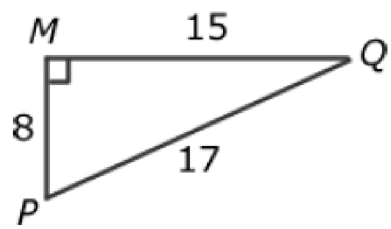
To the nearest tenth of a degree, what is the measure of the angle created by the ground and the ramp that Leah builds in part B? Enter your answer in the box.

$3.6\ degrees$

MAFS.912.G-SRT.3.6 EOC Practice

Level 2	Level 3	Level 4	Level 5
calculates unknown side lengths using the Pythagorean theorem given a picture of a right triangle; recognizes the sine, cosine, or tangent ratio when given a picture of a right triangle with two sides and an angle labeled	solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem in applied problems; uses the relationship between sine and cosine of complementary angles	assimilates that the ratio of two sides in one triangle is equal to the ratio of the corresponding two sides of all other similar triangles leading to definitions of trigonometric ratios for acute angles; explains the relationship between the sine and cosine of complementary angles; solves for missing angles of right triangles using sine, cosine, and tangent	uses the modeling context to solve problems that require more than one trigonometric ratio and/or the Pythagorean theorem; solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem when side lengths and/or angles are given using variables

1. What is the sine ratio of $\angle P$ in the given triangle?



A. $\frac{8}{17}$

B. $\frac{8}{15}$

C. $\frac{15}{17}$

D. $\frac{15}{8}$

2. Kendall drew a right triangle. The tangent value for one angle in her triangle is 1.8750. Which set of side lengths could belong to a right triangle similar to the triangle Kendall drew?

A. 16 cm, 30 cm, 35 cm

B. 8 cm, 15 cm, 17 cm

C. 6 cm, 8 cm, 10 cm

D. 1.875 cm, 8 cm, 8.2 cm

3. Angles F and G are complementary angles.
   - As the measure of angle F varies from a value of x to a value of y, $sin(F)$ increases by 0.2.

How does $cos(G)$ change as F varies from x to y?

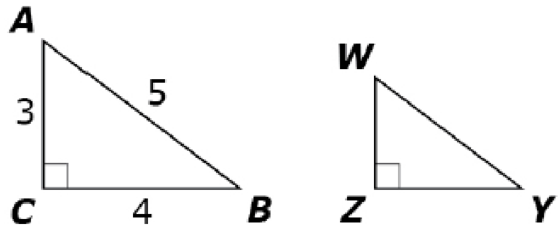
A. It increases by a greater amount.

B. It increases by the same amount.

C. It increases by a lesser amount.

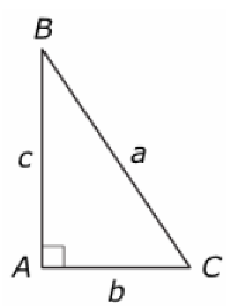
D. It does not change.

4. Triangle ABC is similar to triangle WYZ.
   Select all angles whose tangent equals $\frac{3}{4}$.



- ☐ ∠A
- ☐ ∠B
- ☐ ∠C
- ☐ ∠W
- ☐ ∠Y
- ☐ ∠Z

5. The figure shows right ΔABC.



Of the listed values are equal to the sine of B? Select ALL that apply.

- ☐ $\frac{b}{c}$
- ☐ $\frac{c}{a}$
- ☐ $\frac{b}{a}$
- ☐ The cosine of B
- ☐ The cosine of C
- ☐ The cosine of $(90° - B)$
- ☐ The sine of $(90° - C)$

MAFS.912.G-SRT.3.7 EOC Practice

Level 2	Level 3	Level 4	Level 5
calculates unknown side lengths using the Pythagorean theorem given a picture of a right triangle; recognizes the sine, cosine, or tangent ratio when given a picture of a right triangle with two sides and an angle labeled	solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem in applied problems; uses the relationship between sine and cosine of complementary angles	assimilates that the ratio of two sides in one triangle is equal to the ratio of the corresponding two sides of all other similar triangles leading to definitions of trigonometric ratios for acute angles; explains the relationship between the sine and cosine of complementary angles; solves for missing angles of right triangles using sine, cosine, and tangent	uses the modeling context to solve problems that require more than one trigonometric ratio and/or the Pythagorean theorem; solves for sides of right triangles using trigonometric ratios and the Pythagorean theorem when side lengths and/or angles are given using variables

1. Explain why $cos(x) = sin(90 - x)$ for x such that $0 < x < 90$

The acute angles in a right triangle are always complementary. The sine of any acute angle is equal to the cosine of its complement.

2. Which is equal to $sin\ 30°$?

A. cos 30°
B. cos 60°
C. sin 60°
D. sin 70°

3. Adnan states if $cos 30° \approx 0.866$, then $sin 30° \approx 0.866$. Which justification correctly explains whether or not Adnan is correct?

A. Adnan is correct because $cosx°$ and $sinx°$ are always equivalent in any right triangle.
B. Adnan is correct because $cosx°$ and $sinx°$ are only equivalent in a $30° - 60° - 90°$ triangle.
C. Adnan is incorrect because $cosx°$ and $sin(90 - x)°$ are always equivalent in any right triangle.
D. Adnan is incorrect because only $cosx°$ and $cos(90 - x)°$ are equivalent in a 30°-60°-90° triangle.

4. In right triangle ABC, $m\angle B \neq m\angle C$. Let $\sin B = r$ and $\cos B = s$. What is $\sin C - \cos C$?

A. $r + s$
B. $r - s$
C. $s - r$
D. $\frac{r}{s}$

5. In right triangle ABC with the right angle at C, $sin\ A = 2x + 0.1$ and $cos\ B = 4x - 0.7$.

Determine and state the value of x. Enter your answer in the box.

0.4