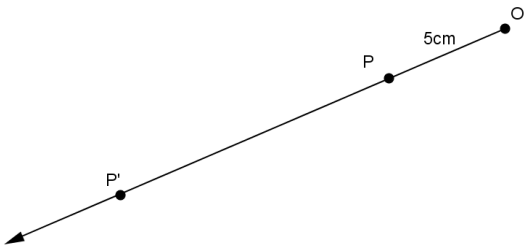
Name _____ Date_____

Lesson 1: What Lies Behind "Same Shape"?

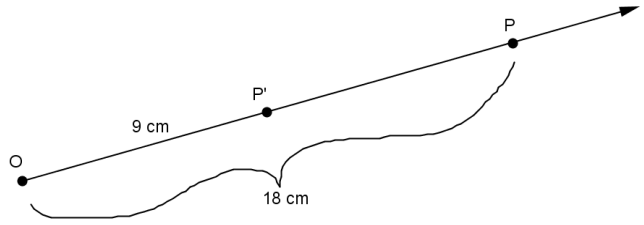
Exit Ticket

1. Why do we need a better definition for similarity than "same shape, not the same size"?

2. Use the diagram below. Let there be a dilation from center O with scale factor $r = 3$. Then $Dilation(P) = P'$. In the diagram below, $|OP| = 5$ cm. What is $|OP'|$? Show your work.



3. Use the diagram below. Let there be a dilation from center O. Then $Dilation(P) = P'$. In the diagram below, $|OP| = 18$ cm and $|OP'| = 9$ cm. What is the scale factor r? Show your work.

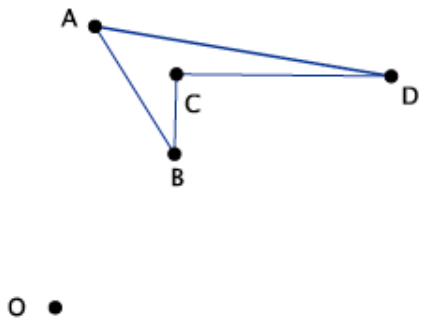


Name _____ Date_____

Lesson 2: Properties of Dilations

Exit Ticket

1. Given center O and quadrilateral $ABCD$, using a compass and ruler, dilate the figure from center O by a scale factor of $r = 2$. Label the dilated quadrilateral $A'B'C'D'$.



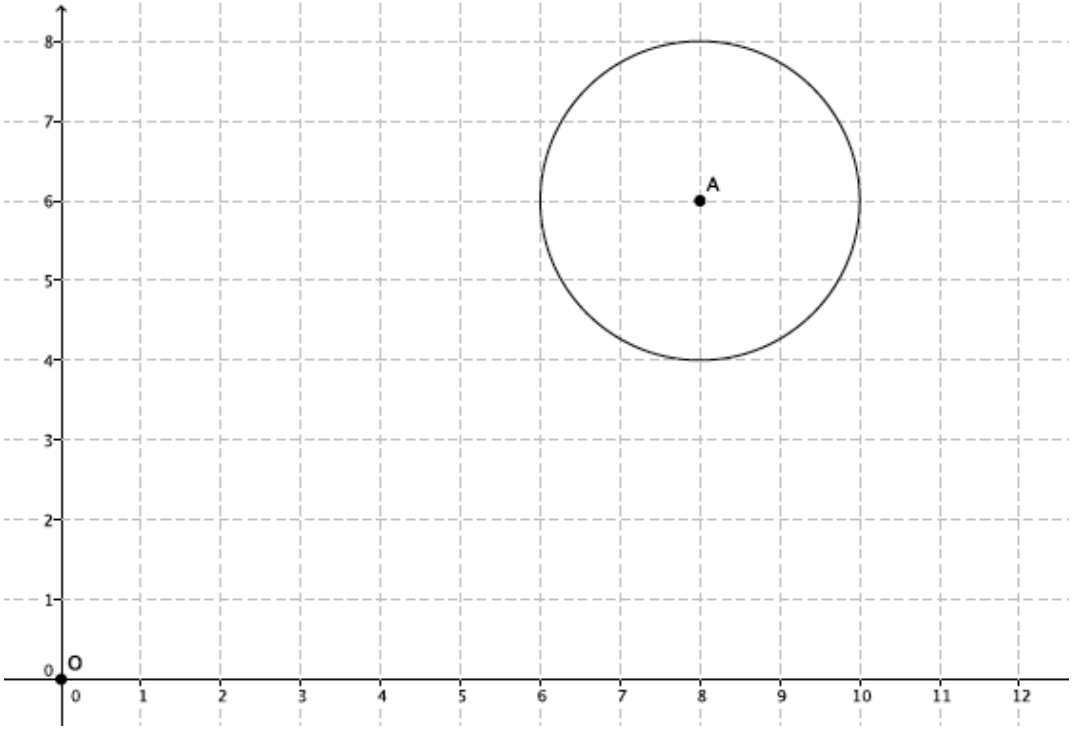
2. Describe what you learned today about what happens to lines, segments, rays, and angles after a dilation.

Name _____ Date_____

Lesson 3: Examples of Dilations

Exit Ticket

1. Dilate circle A from center O by a scale factor $= \frac{1}{2}$. Make sure to use enough points to make a good image of the original figure.



2. What scale factor would magnify the dilated circle back to the original size of circle A? How do you know?

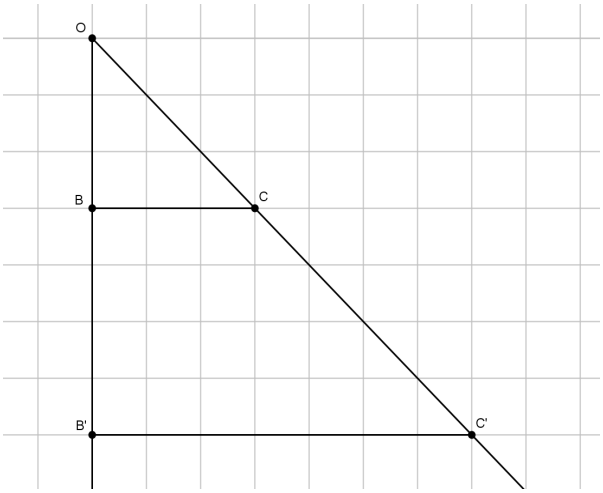
Name _____ Date_____

Lesson 4: Fundamental Theorem of Similarity (FTS)

Exit Ticket

Steven sketched the following diagram on graph paper. He dilated points B and C from point O. Answer the following questions based on his drawing.

1. What is the scale factor r? Show your work.



2. Verify the scale factor with a different set of segments.

3. Which segments are parallel? How do you know?

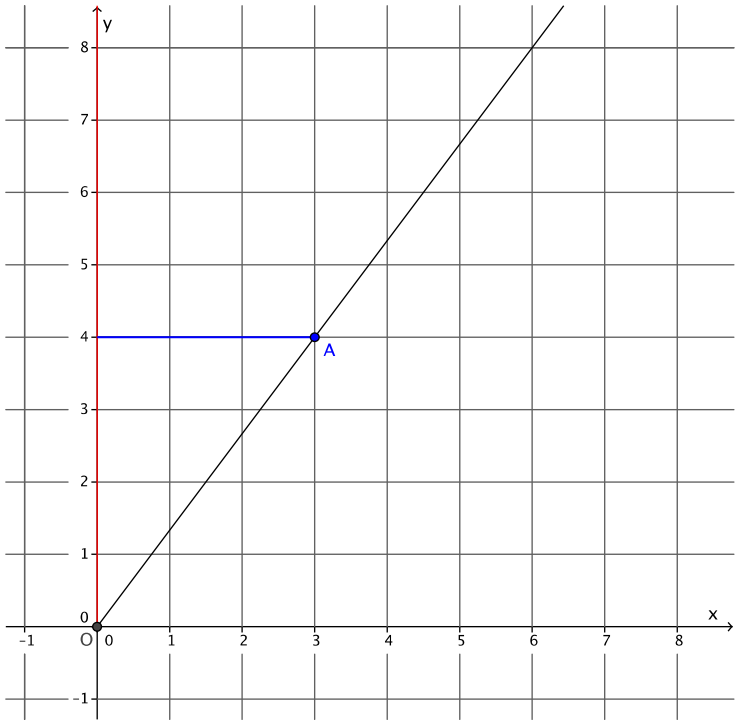
4. Are $\angle OBC$ and $\angle OB'C'$ right angles? How do you know?

Name _____ Date_____

Lesson 5: First Consequences of FTS

Exit Ticket

In the diagram below, you are given center O and ray $\overrightarrow{OA}$. Point A is dilated by a scale factor $r = \frac{6}{4}$. Use what you know about FTS to find the location of point A'.



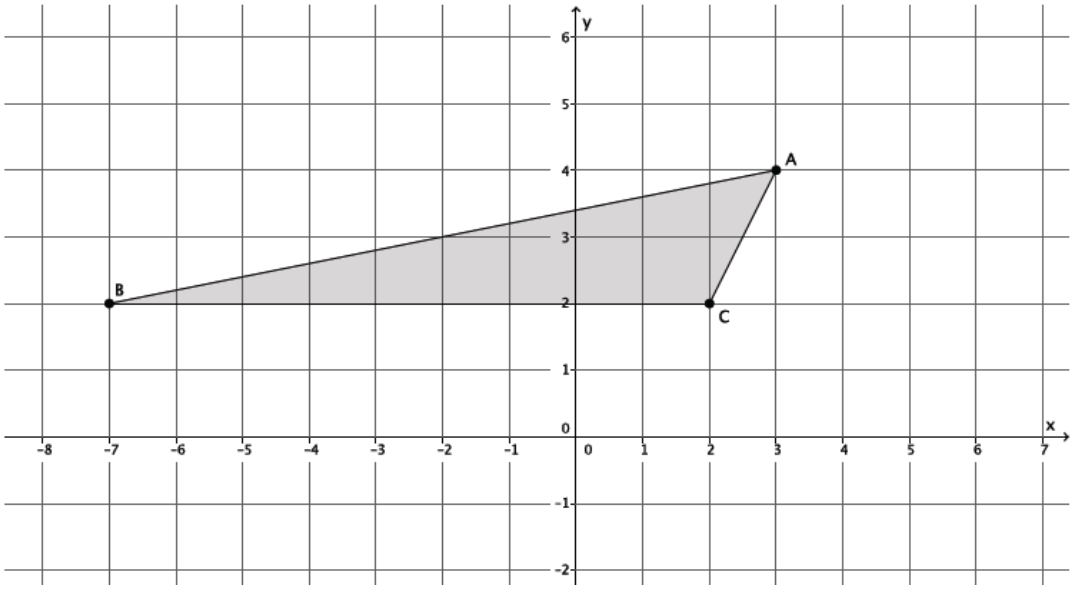
Name _____ Date _____

Lesson 6: Dilations on the Coordinate Plane

Exit Ticket

1. The point $A = (7, 4)$ is dilated from the origin by a scale factor $r = 3$. What are the coordinates of A'?

2. The triangle ABC, shown on the coordinate plane below, is dilated from the origin by scale factor $r = \frac{1}{2}$. What is the location of triangle $A'B'C'$? Draw and label it on the coordinate plane.

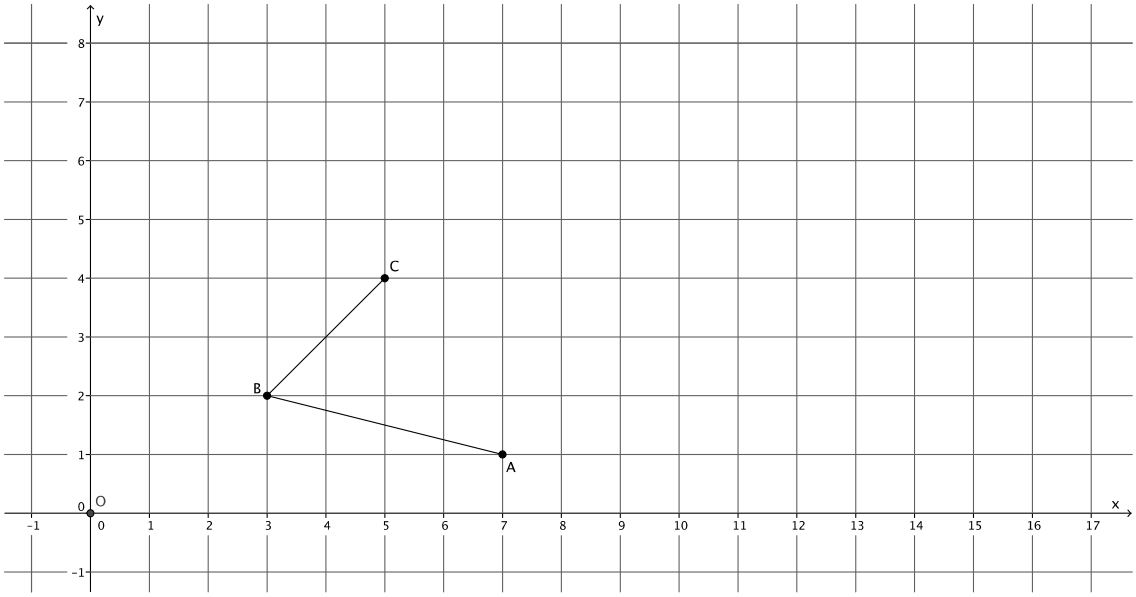


Name _____ Date_____

Lesson 7: Informal Proofs of Properties of Dilations

Exit Ticket

Dilate $\angle ABC$ with center O and scale factor $r = 2$. Label the dilated angle, $\angle A'B'C'$.



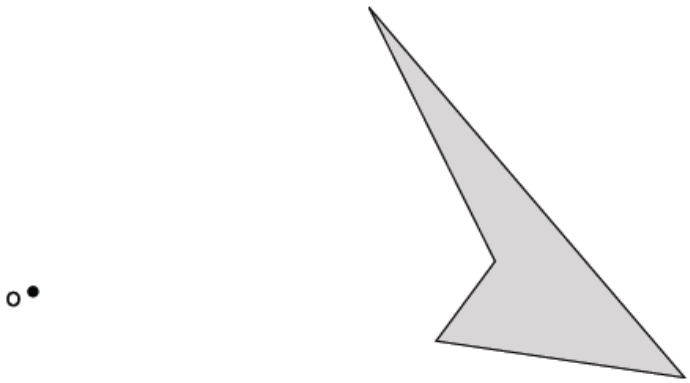
1. If $\angle ABC = 72°$, then what is the measure of $\angle A'B'C'$?

2. If segment AB is 2 cm. What is the measure of segment $A'B'$?

3. Which segments, if any, are parallel?

Name _____ Date _____

1. Use the figure below to complete parts (a) and (b).

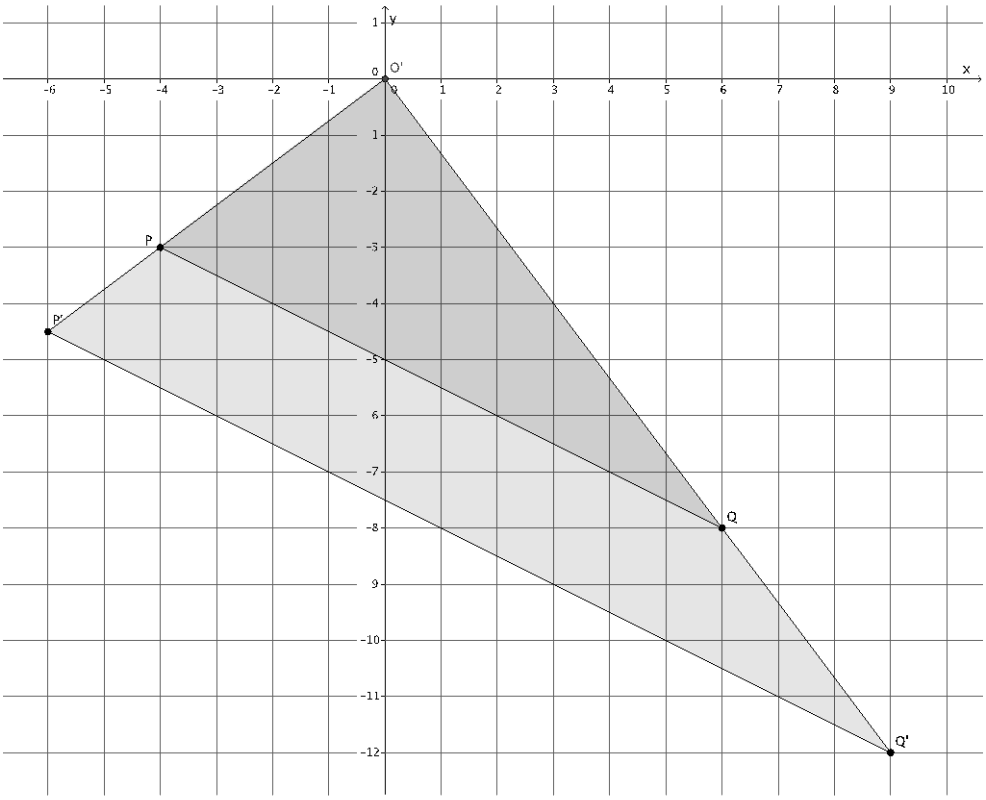


a. Use a compass and ruler to produce an image of the figure with center O and scale factor $r = 2$.

b. Use a ruler to produce an image of the figure with center O and scale factor $r = \frac{1}{2}$.

2. Use the diagram below to answer the questions that follow.

Let D be the dilation with center O and scale factor $r > 0$ so that $Dilation(P) = P'$ and $Dilation(Q) = Q'$.

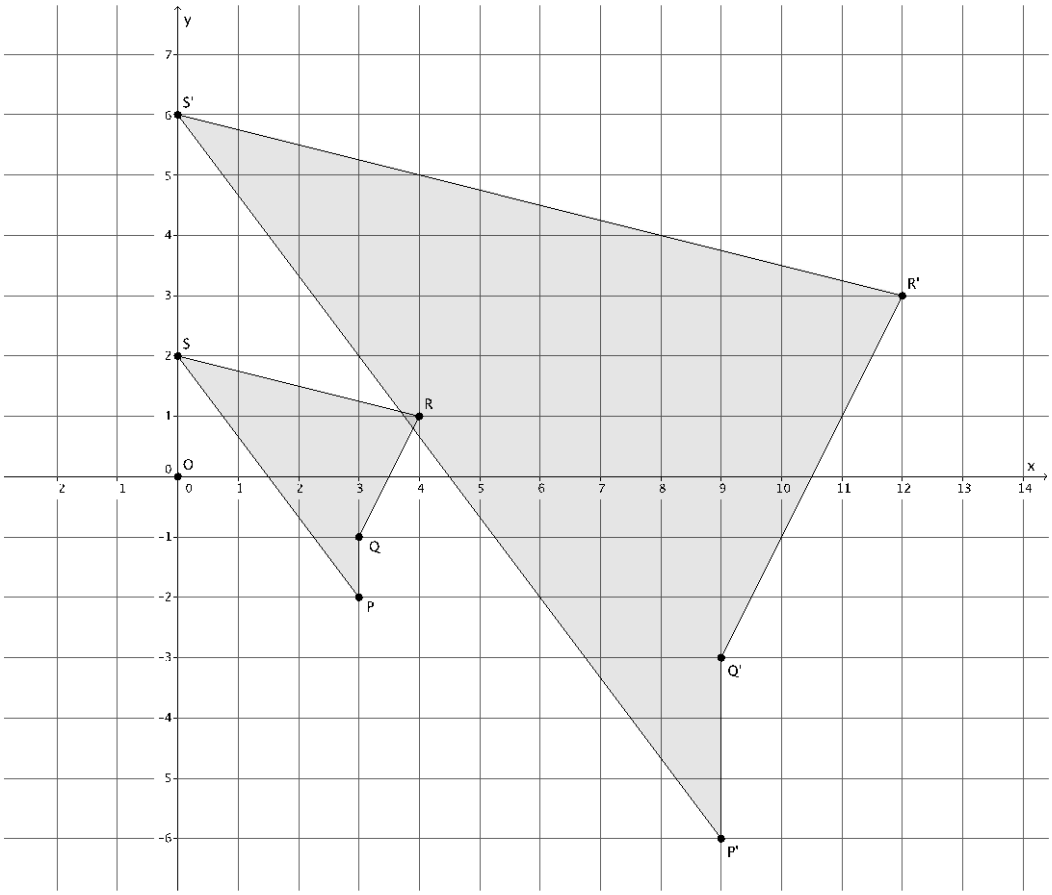


a. Use lengths $|OQ| = 10$ units and $|OQ'| = 15$ units to determine the scale factor r of dilation D. Describe how to determine the coordinates of P' using the coordinates of P.

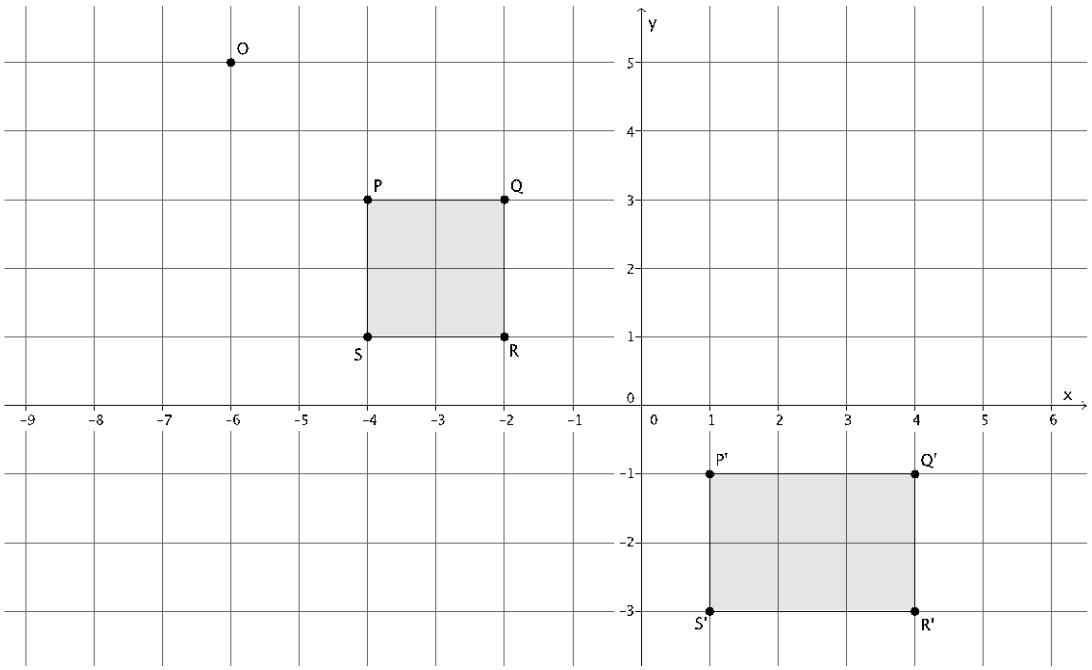
b. If $|OQ| = 10$ units, $|OQ'| = 15$ units, and $|P'Q'| = 11.2$ units, determine the length of $|PQ|$. Round your answer to the tenths place, if necessary.

3. Use a ruler and compass, as needed, to answer parts (a) and (b).

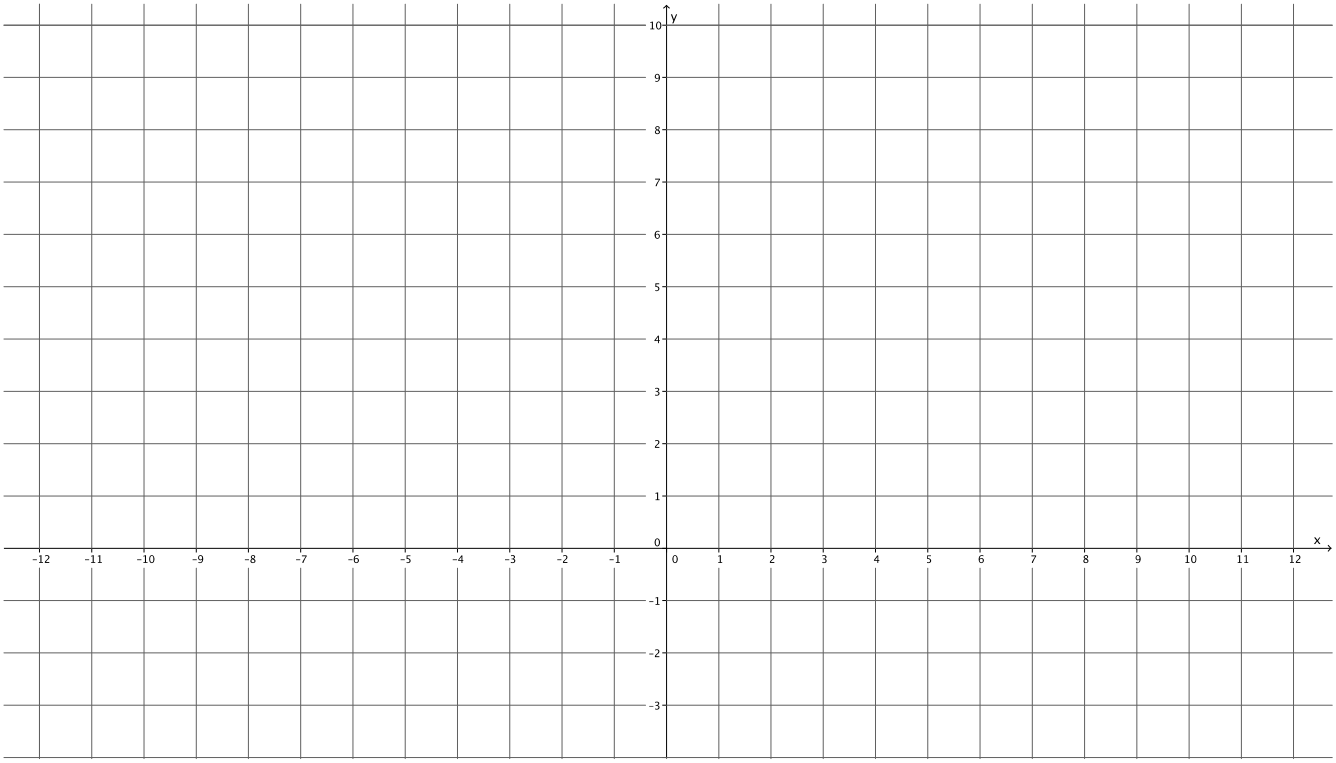
   a. Is there a dilation D with center O that would map figure $PQRS$ to figure $P'Q'R'S'$? If yes, describe the dilation in terms of coordinates of corresponding points.



b. Is there a dilation D with center O that would map figure $PQRS$ to figure $P'Q'R'S'$? If yes, describe the dilation in terms of coordinates of corresponding points.



c. Triangle ABC is located at points $A = (-4, 3)$, $B = (3, 3)$, and $C = (2, -1)$ and has been dilated from the origin by a scale factor of 3. Draw and label the vertices of triangle ABC. Determine the coordinates of the dilated triangle $A'B'C'$, and draw and label it on the coordinate plane.

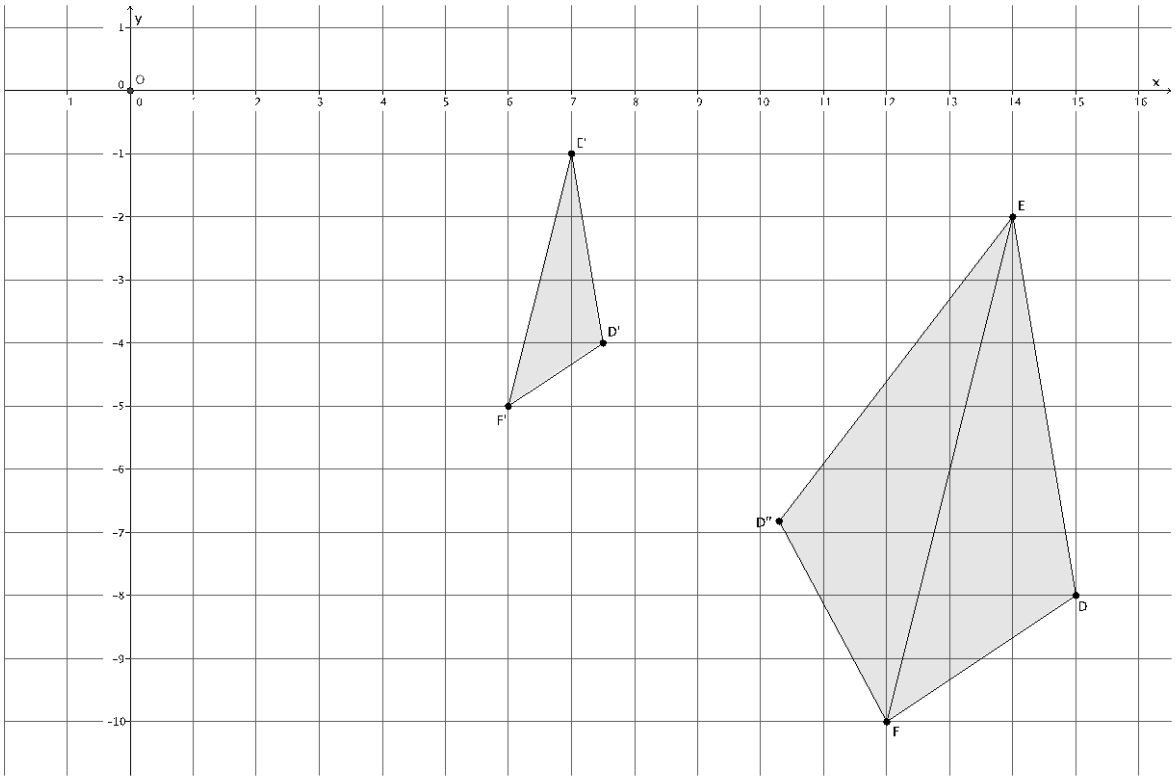


Name _____ Date_____

Lesson 8: Similarity

Exit Ticket

In the picture below, we have a triangle DEF that has been dilated from center O by scale factor $r = \frac{1}{2}$. The dilated triangle is noted by $D'E'F'$. We also have a triangle $D''EF$, which is congruent to triangle DEF (i.e., $\triangle DEF \cong \triangle D''EF$). Describe the sequence of a dilation followed by a congruence (of one or more rigid motions) that would map triangle $D'E'F'$ onto triangle $D''EF$.

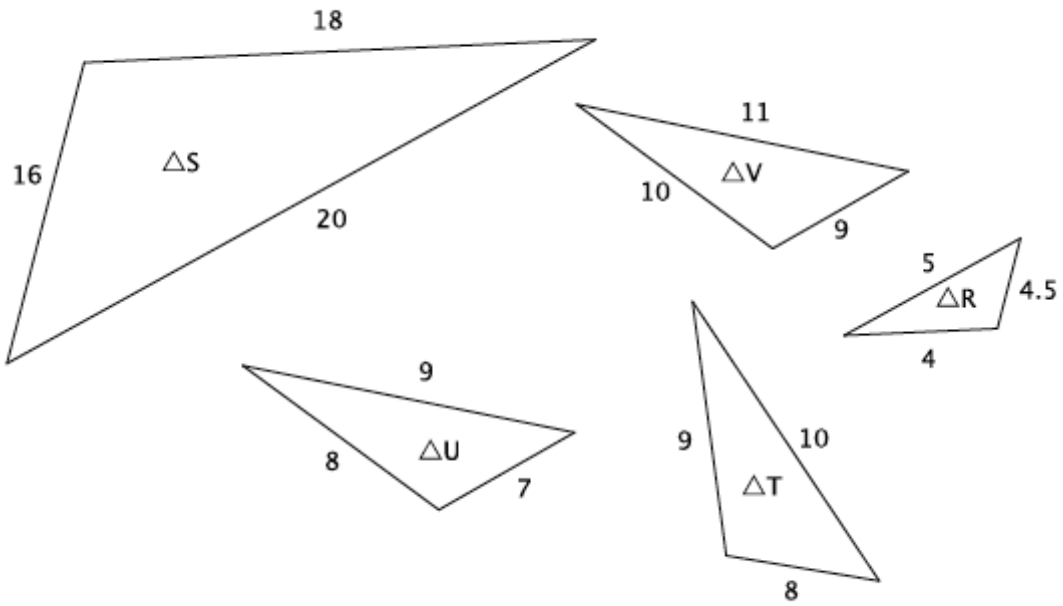


Name _____ Date_____

Lesson 9: Basic Properties of Similarity

Exit Ticket

Use the diagram below to answer Questions 1 and 2.



1. Which two triangles, if any, have similarity that is symmetric?

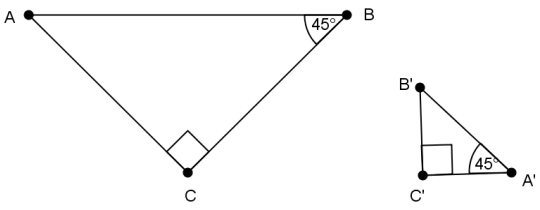
2. Which three triangles, if any, have similarity that is transitive?

Name _____ Date_____

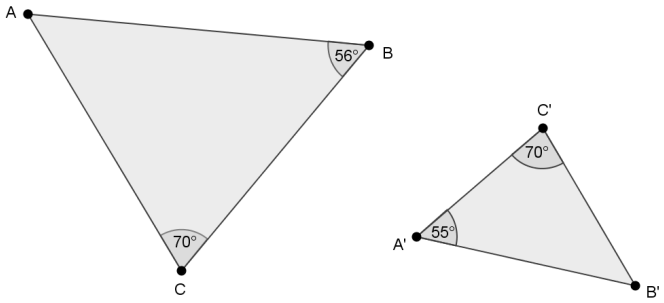
Lesson 10: Informal Proof of AA Criterion for Similarity

Exit Ticket

1. Are the triangles shown below similar? Present an informal argument as to why they are or are not similar.



2. Are the triangles shown below similar? Present an informal argument as to why they are or are not similar.

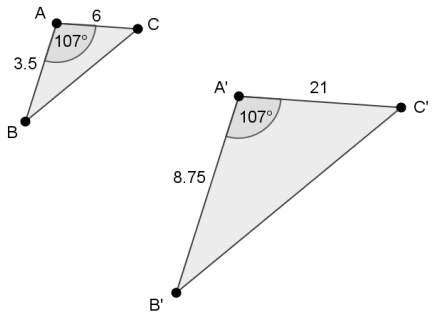


Name _____ Date_____

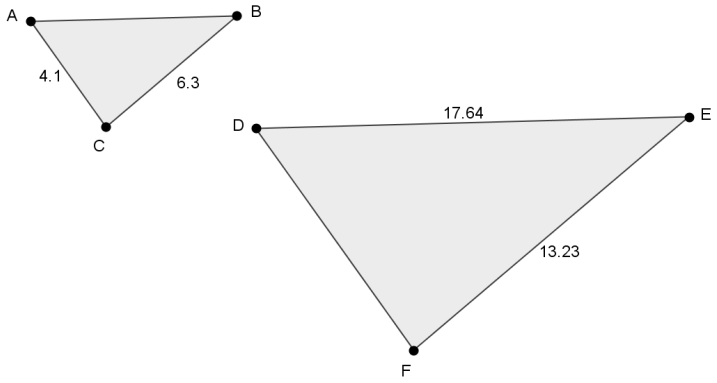
Lesson 11: More About Similar Triangles

Exit Ticket

1. In the diagram below, you have $\triangle ABC$ and $\triangle A'B'C'$. Based on the information given, is $\triangle ABC \sim \triangle A'B'C'$? Explain.



2. In the diagram below, $\triangle ABC \sim \triangle DEF$. Use the information to answer parts (a)–(b).



a. Determine the length of side AB. Show work that leads to your answer.

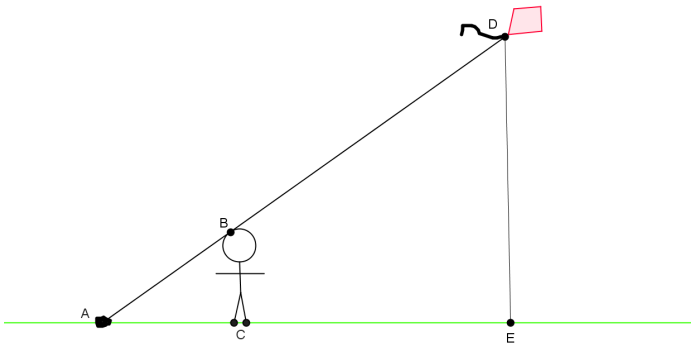
b. Determine the length of side DF. Show work that leads to your answer.

Name _____ Date_____

Lesson 12: Modeling Using Similarity

Exit Ticket

Henry thinks he can figure out how high his kite is while flying it in the park. First, he lets out 150 feet of string and ties the string to a rock on the ground. Then he moves from the rock until the string touches the top of his head. He stands up straight, forming a right angle with the ground. He wants to find out the distance from the ground to his kite. He draws the following diagram to illustrate what he has done.

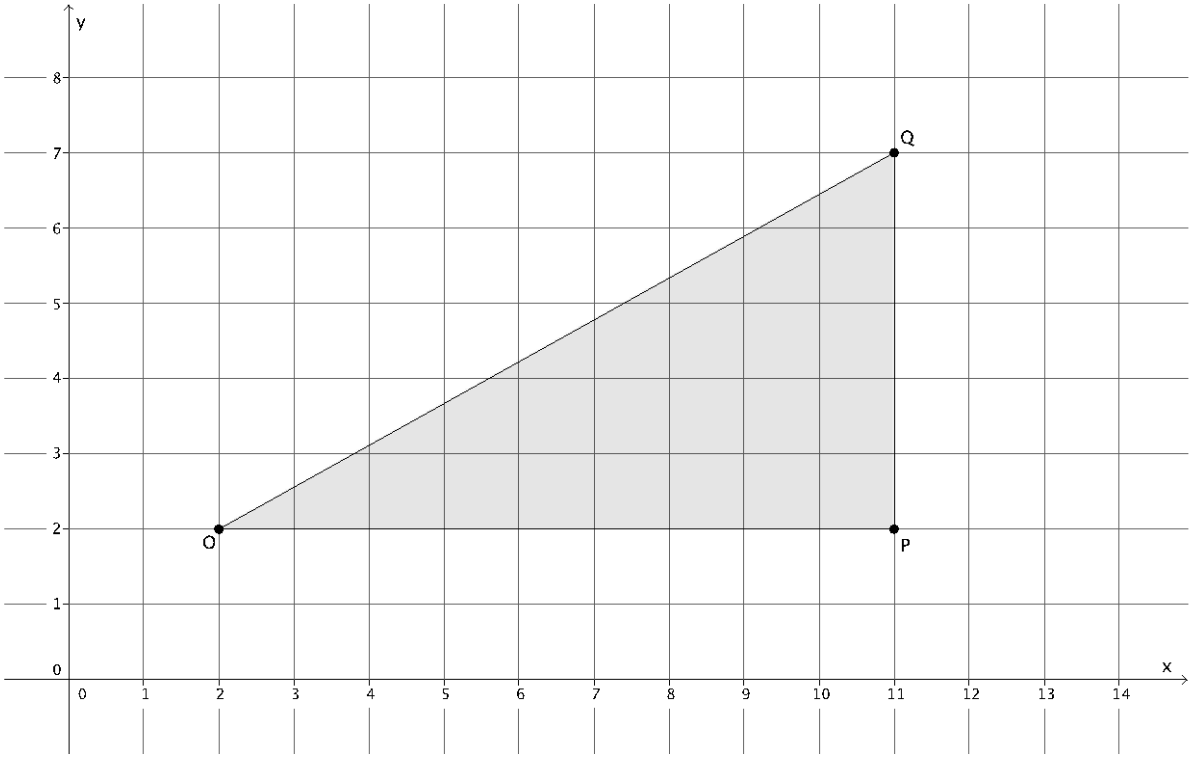


a. Has Henry done enough work so far to use similar triangles to help measure the height of the kite? Explain.

a. Henry knows he is $5\frac{1}{2}$ feet tall. Henry measures the string from the rock to his head and found it to be 8 feet. Does he have enough information to determine the height of the kite? If so, find the height of the kite. If not, state what other information would be needed.

Name _____ Date _____

1. Use the diagram below to answer the questions that follow.



a. Dilate triangle $\Delta\, OPQ$ from center O and scale factor $r = \frac{4}{9}$. Label the image $\Delta OP'Q'$.

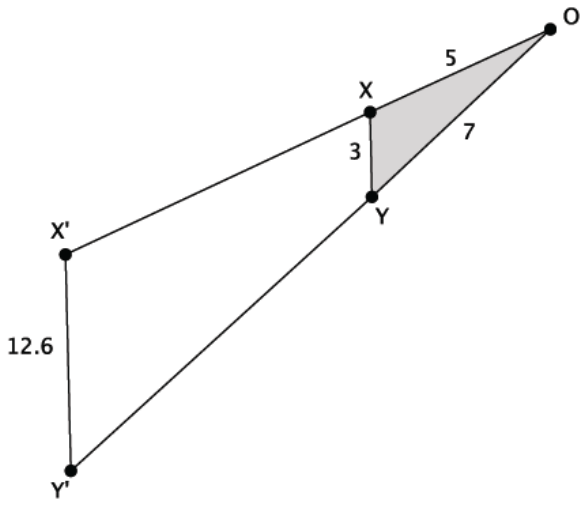
b. Find the coordinates of P' and Q'.

c. Are $\angle OQP$ and $\angle OQ'P'$ equal in measure? Explain.

d. What is the relationship between the lines PQ and $P'Q'$? Explain in terms of similar triangles.

e. If the length of segment $OQ = 9.8$ units, what is the length of segment OQ'? Explain in terms of similar triangles.

2. Use the diagram below to answer the questions that follow. The length of each segment is as shown: segment OX is 5 units, segment OY is 7 units, segment XY is 3 units, and segment $X'Y'$ is 12.6 units.

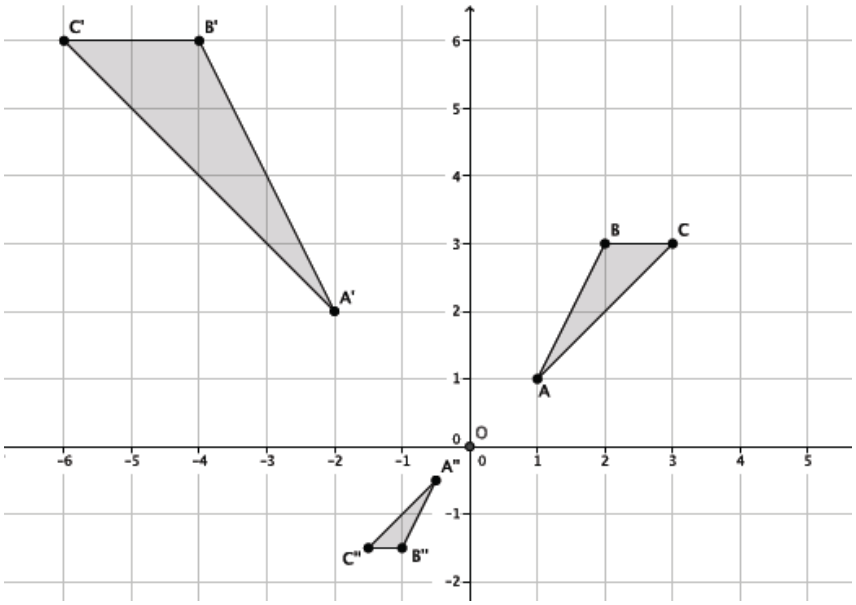


a. Suppose segment XY is parallel to segment $X'Y'$. Is triangle ΔOXY similar to triangle $\triangle OX'Y'$? Explain.

b. What is the length of segment OX'? Show your work.

c. What is the length of segment OY'? Show your work.

3. Given $\triangle ABC \sim \triangle A'B'C'$ and $\triangle ABC \sim \triangle A''B''C''$ in the diagram below, answer parts (a)–(c).



a. Describe the sequence that shows the similarity for $\triangle ABC$ and $\triangle A'B'C'$.

b. Describe the sequence that shows the similarity for $\triangle ABC$ and $\triangle A''B''C''$.

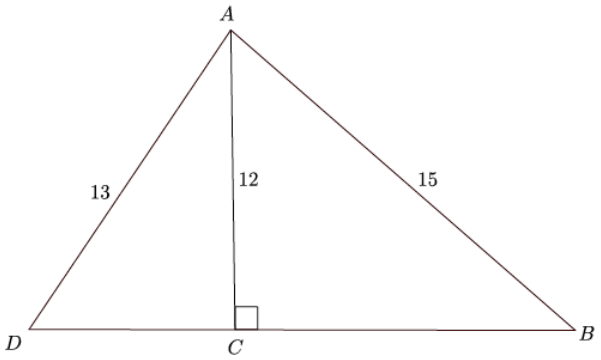
c. Is $\triangle A'B'C'$ similar to $\triangle A''B''C''$? How do you know?

Name _____ Date_____

Lesson 13: Proof of the Pythagorean Theorem

Exit Ticket

Determine the length of side BD in the triangle below.

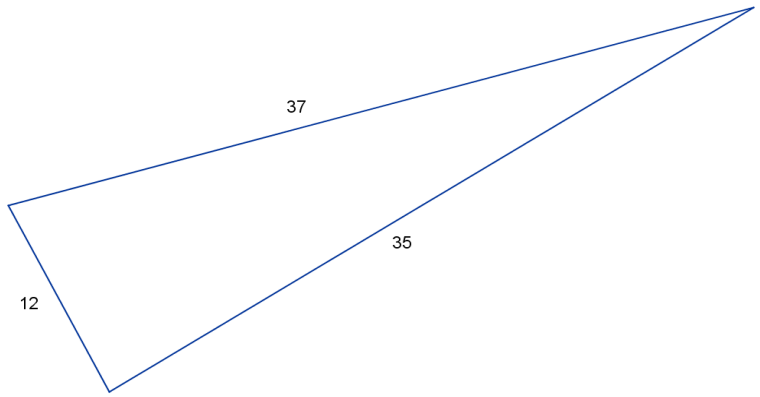


Name _____ Date_____

Lesson 14: The Converse of the Pythagorean Theorem

Exit Ticket

1. The numbers in the diagram below indicate the lengths of the sides of the triangle. Bernadette drew the following triangle and claims it a right triangle. How can she be sure?



2. Will the lengths 5, 9, and 14 form a right triangle? Explain.