

6 Week Review

Name _____ Date _____ Block _____

What have we learned so far?

Transformations

1. Name the 4 types of transformations.

Rotation, Reflection, Translation, and Dilation

2. Which transformation only creates similar figures and why?

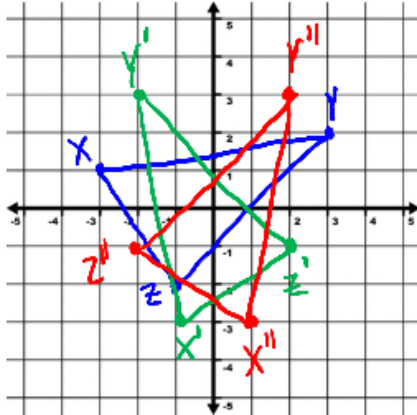
A dilation can only create similar figures, because it changes the size of a shape but preserves angle measures. Similar figures have different sizes but the same angle measures

3. What transformation are rigid motions?

Rotation, Reflection, translation

4. **Rotate** the figure with the given vertices **90° Counter Clockwise about the origin**, then **reflect it over the y-axis**.

$X(-3,1)$, $Y(3,2)$, $Z(-1,-2)$



What is the coordinate notation for the transformations given?

$$X(-3,1) \rightarrow X'(-1,-3) \rightarrow X''(1,-3)$$

Second term sign change & swap
First term sign change.

$$(x,y) \rightarrow (-y,x) \rightarrow (y,x)$$

$$(-3,1) \rightarrow (1,-3)$$

$$(x,y) \rightarrow (y,x)$$

Similarity

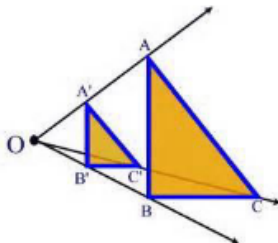
1. In terms of dilations, define the following terms in your own words.

a. preimage - The figure that will be dilated.

b. image - The new figure created after a dilation.

c. scale factor - the ratio of the image divided by the preimage

2. Identify the preimage, image, and provide a possible scale factor for the following figures.

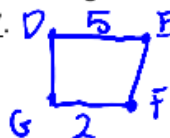


a. preimage - $\triangle ABC$

b. image - $\triangle A'B'C'$

c. Scale factor - $k = 1/2$

3. Given that figure DEFG and figure D'E'F'G' are similar and that FG is 2, DE is 5, and F'G' is 7 find the scale factor and the length of D'E'.



$$\text{Scale factor } k = \frac{7}{2} = 3.5$$

$$D'E' = 3.5(5) = 17.5$$

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Triangle Similarity

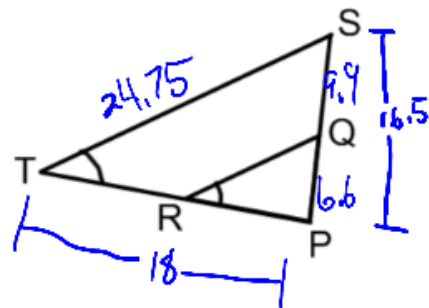
1. Decide if the following triangles are similar. State the postulate or theorem that you could use to show that.

Yes by AA $\angle T \cong \angle R, \angle P \cong \angle P$

2. If \overline{ST} is ~~24.75~~, \overline{SP} is 16.5, \overline{SQ} is ~~9.9~~ what is the length of \overline{QR} ?

$$\frac{\overline{ST}}{\overline{QR}} = \frac{\overline{SP}}{\overline{QP}} \rightarrow \frac{24.75}{\overline{QR}} = \frac{16.5}{6.6} \quad 16.5 \overline{QR} = 163.35$$

$$\overline{QR} = 9.9$$

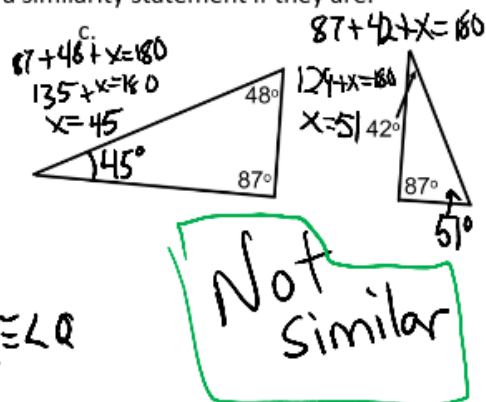
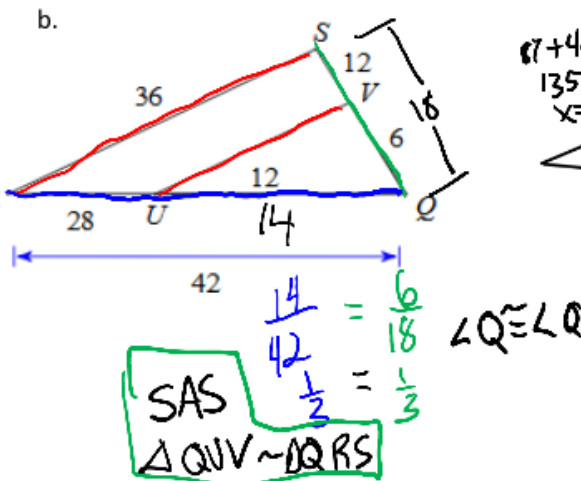
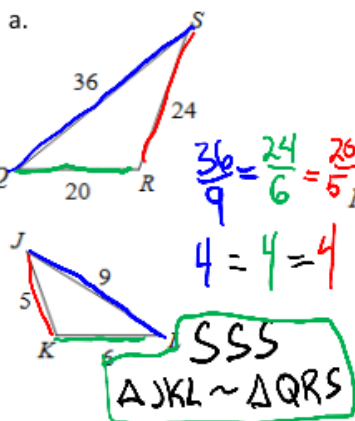


3. What is the length of \overline{RP} if \overline{TP} is 18?

$$\frac{16.5}{6.6} = \frac{18}{\overline{RP}} \quad 16.5 \overline{RP} = 118.8$$

$$\overline{RP} = 7.2$$

4. Provide evidence to show that the following triangles are similar or not. Write a similarity statement if they are.



Congruence as a Rigid Motion

1. A figure has the coordinates A(-1, 3), B(2, -1), C(2, -4). Apply the given transformation, identify the transformation(s), and explain if the image produced is congruent to the preimage.

a. $(x, y) \rightarrow (3x, 3y)$

A(-3, 9) B(6, -3) C(6, -12)

Dilation with scale factor of 3.

The figures would not be congruent because a dilation is not a rigid motion and only rigid motions create congruent figures.

b. $(x, y) \rightarrow (-y, -x)$

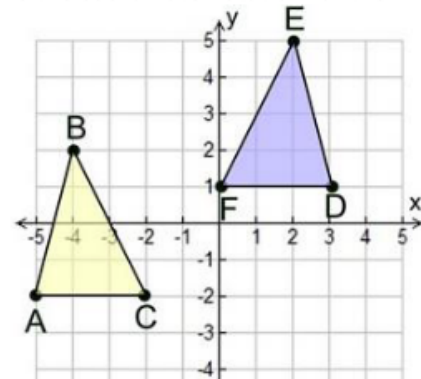
A(-3, 1) B(1, -2) C(4, -2)

Reflection over the line $y = -x$

The two figures would be congruent because a reflection is a rigid motion. Rigid motions create congruent figures.

2. For the following figures state if they are congruent and how you know. Then give the coordinate notation for the transformations used to map one onto the other.

$\Delta ABC \cong \Delta DEF$ because ΔABC can be mapped onto ΔDEF by a sequence of rigid motions. This sequence is a reflection over the y -axis, then a translation left 2 and up 3. The coordinate notation for this would be: $(x, y) \rightarrow (-x - 2, y + 3)$.



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Proving Triangles Congruent

1. For the following triangles decide which triangle postulate, if any, can prove the triangles congruent. Then prove them to be congruent or state no conclusion.

a.

Given that $\overline{AB} \cong \overline{AC}$, $\angle B \cong \angle C$, and $\overline{BD} \cong \overline{CD}$, $\triangle ABD \cong \triangle ACD$ by SAS.

b.

Given that $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\overline{CA} \cong \overline{FD}$, $\triangle ABC \cong \triangle DEF$ by SSS.

c.

Given that $\angle ADB$ and $\angle CDB$ are right angles, $\overline{AB} \cong \overline{CB}$ and by the reflexive property $\overline{BD} \cong \overline{BD}$, $\triangle ABD \cong \triangle CBD$ by HL.

d.

Given $\angle A \cong \angle C$, $\overline{AD} \cong \overline{CD}$, and $\angle BDA \cong \angle BDC$ because they are both right angles, $\triangle ABD \cong \triangle CBD$ by ASA.

- e. In the above problem, problem letter a. has two possible ways to show congruence, what is the second way?

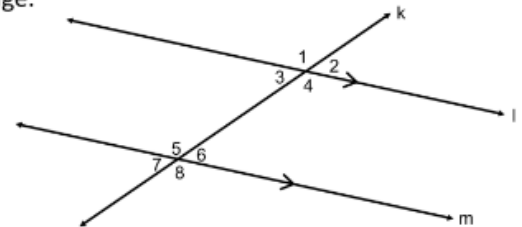
Given that $\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{CD}$, and by the reflexive property $\overline{DA} \cong \overline{DA}$, $\triangle ABD \cong \triangle ACD$ by SSS.

Proving Parallel Line Properties

1. Prove the following parallel line properties to be true using the given image.

- a. Given $\vec{l} \parallel \vec{m}$, prove that $\angle 3$ is supplementary to $\angle 5$.

Statement	Reason
1. $\vec{l} \parallel \vec{m}$	1. Given
2. $\angle 3 \cong \angle 7$	2. Corr. \angle 's Post.
3. $m\angle 3 = m\angle 7$	3. Def. of Congruence
4. $\angle 7$ and $\angle 5$ are Supplementary	4. Linear Pairs
5. $m\angle 7 + m\angle 5 = 180$	5. Def. of supplementary
6. $m\angle 3 + m\angle 5 = 180$	6. Substitution
7. $\angle 3$ and $\angle 5$ are Supplementary	7. Definition of Supplementary



- b. Given $\vec{l} \parallel \vec{m}$, prove that $\angle 1 \cong \angle 8$.

Statement	Reason
1. $\vec{l} \parallel \vec{m}$	1. Given
2. $\angle 1 \cong \angle 5$	2. Corr. \angle 's Post.
3. $\angle 5 \cong \angle 8$	3. Vertical \angle 's Thm.
4. $\angle 1 \cong \angle 8$	4. Transitive Property.

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Triangle Theorems

Use the Triangle Proportionality Theorem to solve the following problems.

1. If \overline{AD} is 4.5, \overline{AE} is $3x$, \overline{DB} is 6, and \overline{EC} is $7x-9$,

- a. What is the value of x ?

$$\frac{4.5}{3x} = \frac{6}{7x-9} \rightarrow \frac{18x}{4.5} = \frac{4.5(7x-9)}{4.5} \rightarrow \frac{4x}{-x} = \frac{7x-9}{-x}$$

$$4x = 7x - 9$$

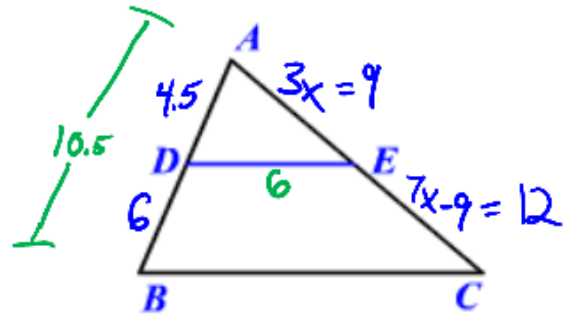
$$-3x = -9$$

$$x = 3$$

- b. What is the length of \overline{BC} if \overline{DE} is 6?

$$\frac{4.5}{10.5} = \frac{6}{BC} \rightarrow \frac{4.5 BC}{4.5} = \frac{63}{4.5}$$

$$BC = 14$$



Use the Triangle Midsegment Theorem to solve the following problems.

1. \overline{DE} is a midsegment of $\triangle ABC$.

- a. If $\overline{DE} = 2x + 6$ and $\overline{BC} = 14x - 3$, what is the value of x ?

$$2(2x+6) = \frac{1}{2}(14x-3) \cdot 2$$

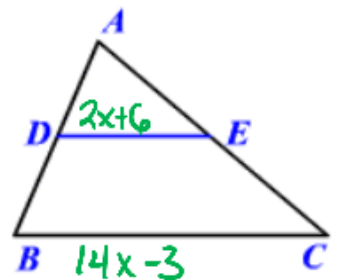
$$4x + 12 = 14x - 3$$

$$-10x = -15$$

$$x = 1.5$$

- b. What is the length of \overline{DE} ?

$$DE = 2(1.5) + 6 = 9$$



Use the Exterior Angle Theorem to solve the following problems.

Ext. Angle = Sum of int. nonadjacent \angle 's

1. What is the value of x in the figure on the right?

$$11x - 10 = 6x + 11 + 39$$

$$11x - 10 = 6x + 50$$

$$5x - 10 = 50$$

$$5x = 60$$

$$x = 12$$

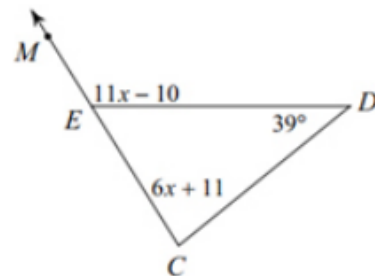
2. What is the measure of $\angle CED$?

$$1(12) - 10 + \angle CED = 180$$

$$132 - 10 + \angle CED = 180$$

$$122 + \angle CED = 180$$

$$\angle CED = 58^\circ$$



Use the Triangle Sum Theorem to solve the following problems.

1. Find the value of each of the missing angles.

$$x = 39^\circ, y = 107^\circ, z = 73^\circ$$

$$j = 85^\circ, k = 49^\circ$$

