

September 4, 2018

Find x.

4)

Determine if the two triangles are congruent. If they are, state how you know.

3)

4)

5)

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Quiz Review

1) $\triangle RAC \cong \triangle RTO$ by AAS

2) $\triangle KAD \cong \triangle KST$ by SAS

3) $\triangle XYW \cong \triangle ZYW$ by AAS

5) $\triangle KMJ \cong \triangle KLN$ by NONE

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11) $\triangle MNP \cong \triangle OPN$ $\overline{MN} \cong \overline{OP}$

STATEMENT	REASONS
1 $\angle MNP \cong \angle OPN$	1 Given
2 $\overline{MN} \cong \overline{OP}$	2 Given
3 $\overline{NP} \cong \overline{NP}$	3 Reflexive Prop.
4 $\triangle MNP \cong \triangle OPN$	4 SAS

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Unit 2 Test Part 1 Study Guide

1. Which theorems or rule are used to prove that two triangles are congruent?
SSS, AAS, SAS, ASA, HL

2. Consider the triangles shown. Which rule, if any, can be used to prove triangle congruency?
AAS, ASA, SAS, SSS

3. If $m\angle 1 = 40$ and $m\angle 2 = 30$, find $m\angle 4$ and $m\angle 5$.

4. In the diagram below, $m\angle 2 = 5(x+1)$, $m\angle 3 = 3(x+5)$. Find x and the measure of $\angle 2$.

5. Find $m\angle 3$ if $m\angle 1 = 3x + 1$ and $m\angle 2 = 7x - 16$. Find $m\angle 4$ if $m\angle 5 = 99$.

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7. $\triangle PQR$ and $\triangle STU$ are congruent triangles. Using this information, list the corresponding sides and corresponding angles.

8. For $\triangle EFG$ and $\triangle MNP$, it is known that $\overline{EG} \cong \overline{MP}$, $\angle G \cong \angle P$, and $\overline{FG} \cong \overline{NP}$. Determine if the triangles are congruent, and if so, by what method of congruency.

9. In this diagram, \overline{CD} is the perpendicular bisector of \overline{AB} . The two-column proof shows that $\triangle ADC$ is congruent to $\triangle BDC$. Fill in the missing pieces of the proof.

Step	Statement	Reason
1	\overline{CD} is the perpendicular bisector of \overline{AB}	Given
2	$\overline{AD} \cong \overline{BD}$	Definition of bisector
3	$\overline{CD} \cong \overline{CD}$	Reflexive Prop.
4	$\angle ADC \cong \angle BDC$	Definition of perpendicular lines
5	$\triangle ADC \cong \triangle BDC$	All right angles are congruent
6		SAS

10. Given: $\overline{NO} \perp \overline{MP}$ and $\overline{MN} \cong \overline{OP}$. Prove: $\triangle MNP \cong \triangle OPN$.

Steps	Statements	Reasons
1	$\overline{NO} \perp \overline{MP}$ and $\overline{MN} \cong \overline{OP}$	Given
2	$\angle MNP \cong \angle OPN$	Alternate Interior Angles are congruent
3	$\angle NPM \cong \angle ONP$	Alternate Interior Angles are congruent
4	$\overline{NP} \cong \overline{NP}$	Reflexive Prop.
5	$\triangle MNP \cong \triangle OPN$	AAS

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11. Given: E is the midpoint of \overline{AC} and \overline{DB} . Prove: $\triangle ABE \cong \triangle CED$.

Steps	Statements	Reasons
1	Given	Given
2	$\overline{AE} \cong \overline{EC}$	defn of a midpoint
3	$\overline{DE} \cong \overline{DE}$	Reflexive Property
4	$\angle AEB \cong \angle CED$	Vertical Angles
5		SAS

12. $\triangle DEF$ and $\triangle UVW$ are congruent triangles. Which statement is known to be true?
a. $\overline{DE} \cong \overline{UV}$ b. $\overline{DF} \cong \overline{TW}$ c. $\overline{DE} \cong \overline{UV}$ d. $\overline{DE} \cong \overline{TV}$

13. For $\triangle ABC$ and $\triangle DEF$, the following is given: $\angle C \cong \angle F$, $\overline{AB} \cong \overline{DE}$, and $\overline{BC} \cong \overline{EF}$. By which triangle congruence statement can it be concluded that the triangles are congruent?
a. SSS b. SAS c. ASA d. It cannot be determined if the triangles are congruent.

14. $\triangle UVW$ and $\triangle XYZ$ are congruent triangles. Which statement is known to be true?
a. $\angle W \cong \angle X$ b. $\angle V \cong \angle Y$ c. $\angle V \cong \angle X$ d. $\angle V \cong \angle Y$

15. Name all angles for each description.

Corresponding: $\angle 4 \angle 7, \angle 1 \angle 6, \angle 3 \angle 8, \angle 2 \angle 5$
Alternate Interior: $\angle 4 \angle 8, \angle 7 \angle 3$
Alternate Exterior: $\angle 4 \angle 9, \angle 3 \angle 6$
Vertical: $\angle 1 \angle 4, \angle 2 \angle 3, \angle 5 \angle 8, \angle 6 \angle 7$
Same side interior: $\angle 4 \angle 7, \angle 3 \angle 6$

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16. Identify all angle measures.

$\angle 3 = \angle 1 = \angle 6 = 41$
 $\angle 5 = \angle 7 = \angle 4 = \angle 2 = 139$

180 41

Congruent Triangles

17. Determine whether each pair of triangles is congruent. If so, write a congruence statement, and explain why the triangles are congruent.

$\triangle GHI \cong \triangle KJI$ (AAS)
 $\triangle ASP \cong \triangle QSP$ (SAS)
 $\triangle LNO \cong \triangle NLM$ (SAS)

18. For $\triangle ABC$ and $\triangle DEF$ the following is given: $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\overline{AB} \cong \overline{DE}$. Sketch a picture to determine if the two triangles can be proven congruent. If so, how can the $\triangle ABC$ be proved congruent?

Theorems about Lines and Angles

19. Name the relationship and then find the missing angle measures by solving for x .

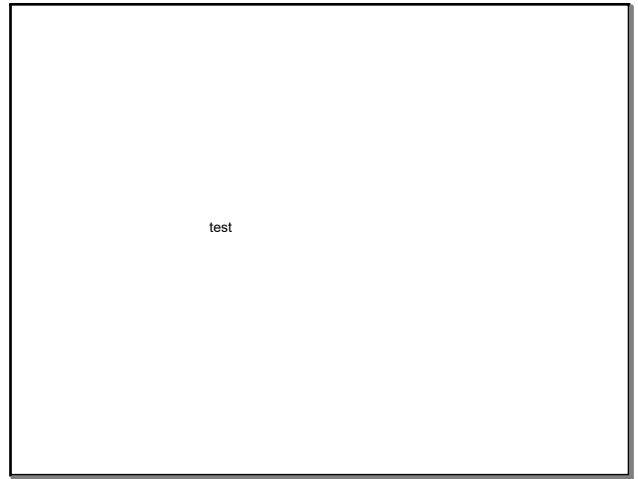
a. $m \angle 1 = 2x + 10$, $m \angle 2 = 86 + x$

b. $(4x + 6)^\circ$, $(11x - 6)^\circ$

c. $(4x + 24)^\circ$, $(7x + 3)^\circ$

d. $(6x + 7)^\circ$, $(3x + 28)^\circ$

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test

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11.1 Dilations

Essential Question: How does a dilation transform a figure?

Explore 1 Investigating Properties of Dilations

1. **Define** a transformation that can change the size of a polygon but leaves its shape unchanged. A dilation has a center of dilation and a scale factor which together determine the position and size of the image of a figure after the dilation.

2. $\triangle ABC$ and its image $\triangle A'B'C'$ after a dilation to answer the following questions.

3. Use a ruler to measure the following lengths. Measure to the nearest tenth of a centimeter.

$AB = ?$ cm $A'B' = ?$ cm
 $AC = ?$ cm $A'C' = ?$ cm
 $BC = ?$ cm $B'C' = ?$ cm

4. Use a protractor to measure the corresponding angles.

$m\angle A = ?$ $m\angle A' = ?$
 $m\angle B = ?$ $m\angle B' = ?$
 $m\angle C = ?$ $m\angle C' = ?$

5. Complete the following ratios.

$\frac{AB}{A'B'} = \frac{AC}{A'C'} = \frac{BC}{B'C'} = \frac{m\angle A}{m\angle A'} = \frac{m\angle B}{m\angle B'} = \frac{m\angle C}{m\angle C'}$

Math

1. What do you notice about the corresponding sides of the figures? What do you notice about the corresponding angles?

2. **Discussion** What similarities are there between reflections, translations, rotations, and dilations? What is the difference?

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Dilations/Translations Worksheet

Directions: Answer the following questions to the best of your ability. For the y-axis, use the same scaling as the x-axis.

1. In Math, the word dilate means to _____ or _____ a figure.

2. If a scale factor is less than 1, then your figure gets _____.

3. If a scale factor is greater than 1, then your figure gets _____.

4. Graph the dilated image of triangle JKL using a scale factor of 3 and $(0,0)$ as the center of dilation.

$J: \quad J': \quad$
 $K: \quad K': \quad$
 $L: \quad L': \quad$

5. Graph the dilated image of quadrilateral $MNOP$ using a scale factor of 3 and the origin as the center of dilation.

$M: \quad M': \quad$
 $N: \quad N': \quad$
 $O: \quad O': \quad$
 $P: \quad P': \quad$

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6. Graph the dilated image of triangle XYZ using a scale factor of 1.5 and $(0,0)$ as the center of dilation.

$X: \quad X': \quad$
 $Y: \quad Y': \quad$
 $Z: \quad Z': \quad$

7. Graph the dilated image of quadrilateral $MNOP$ using a scale factor of 2.5 and the origin as the center of dilation.

$M: \quad M': \quad$
 $N: \quad N': \quad$
 $O: \quad O': \quad$
 $P: \quad P': \quad$

8. Describe the dilation of quadrilateral $MNOP$, using the origin as the center.

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5. The table below shows the coordinates of triangle RST and the coordinates of R' in triangle $R'S'T'$. Triangle $R'S'T'$ is a dilation of triangle RST .

Triangle RST	Triangle $R'S'T'$
R (-2, -3)	R' (-4, -6)
S (0, 2)	S' (0, 2)
T (2, -3)	T' (4, -6)

Part A

What are the coordinates of point S' and point T' ?

Answer $S' = (\quad, \quad)$
 $T' = (\quad, \quad)$

Part B

On the grid below, draw triangle RST and triangle $R'S'T'$.

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Dilations and Scale Factors - Independent Practice Worksheet

Complete all the problems.

1. Graph the image of rectangle KLMN after dilation with a scale factor of 2, centered at the origin.

2. Graph the image of rectangle PQRS after a dilation with a scale factor of 1/4, centered at the origin.

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3. Graph the image of quadrilateral EFGD after a dilation with a scale factor of 3, centered at the origin.

4. Graph the image of quadrilateral PQRS after a dilation with a scale factor of 2, centered at the origin.

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5. Graph the image of quadrilateral FGHI after a dilation with a scale factor of 1/5, centered at the origin.

6. Graph the image of rectangle PQRS after a dilation with a scale factor of 2, centered at the origin.

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7. Graph the image of triangle FGH after a dilation with a scale factor of 5, centered at the origin.

8. Graph the image of quadrilateral KLMN after a dilation with a scale factor of 2, centered at the origin.

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9. Graph the image of rectangle RSTU after a dilation with a scale factor of 1/5, centered at the origin.

10. Graph the image of quadrilateral ABCD after a dilation with a scale factor of 5, centered at the origin.

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Similar Figures Worksheet Name _____ Hour: _____

Fill in the blank with the appropriate word, phrase, or symbol to make a true statement.

- Similar figures have the same _____ but not necessarily the same _____.
- The symbol _____ means "is similar to" and the symbol _____ is the abbreviation for the word angle.
- A _____ drawing is an enlarged or reduced drawing that is similar to an actual object or place.
- In similar triangles, corresponding _____ are congruent and corresponding _____ are in proportion.
- To find a missing side length, set up and solve a _____ . Put the measurements of the smaller figure on top and the bigger figure on the bottom.

Learning Goal # 1: I can identify the corresponding parts of similar figures.

Example: The figures in each pair are similar (AABC ~ AXYZ).

$\angle A$ corresponds with $\angle X$ AB matches with _____
 $\angle B$ matches with $\angle Y$ BA corresponds with _____
 $\angle C$ corresponds with $\angle Z$ BC matches with _____

Practice Problems

1. ASIT ~ ADOG

First, label $\angle D$, $\angle O$, & $\angle G$ on the small triangle. Then, fill in the blanks below:

$\angle D$ corresponds with $\angle S$ DO matches with _____
 $\angle O$ matches with $\angle T$ IT corresponds with _____
 $\angle G$ corresponds with $\angle I$ GI matches with _____

Suppose $\angle S = 25^\circ$, what is the measure of $\angle D$? _____

2. AHOT ~ AFIG

$\angle H$ corresponds with $\angle F$ HI matches with _____
 $\angle O$ matches with $\angle I$ IO corresponds with _____
 $\angle T$ corresponds with $\angle G$ OT matches with _____

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Learning Goal #2: I can find the missing measurements of two similar figures.

Example 1: The figures in each pair are similar (AABC ~ AXYZ).

$\frac{\text{small } \Delta}{\text{big } \Delta} = \frac{3}{5} = \frac{x}{2.5}$

The missing side is $x = \dots$

Example 2: The figures in each pair are similar.

$\frac{\text{small } \square}{\text{big } \square} = \frac{5}{3} = \frac{x}{3}$

The missing side is $x = \dots$

Practice Problems
Find the missing side(s) in each similar figure. Show work!

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Geometry _____
Similar polygons _____
Name _____

1. If polygons are similar then what do you know about the corresponding sides and the corresponding angles?

Given the similar figures, name **all** pairs of corresponding sides and angles. Look at the similarity statement to help.

- $\Delta PQR \sim \Delta DEF$
- $\Delta LMN \sim \Delta RST$
- $\Delta ABCD \sim \Delta EFGH$

$\overline{QP} \rightarrow \dots$ $\angle Q \cong \dots$ $\overline{LM} \rightarrow \dots$ $\angle L \cong \dots$ $\overline{AB} \rightarrow \dots$ $\angle A \cong \dots$
 $\overline{PR} \rightarrow \dots$ $\angle P \cong \dots$ $\overline{MN} \rightarrow \dots$ $\angle M \cong \dots$ $\overline{BC} \rightarrow \dots$ $\angle B \cong \dots$
 $\overline{QR} \rightarrow \dots$ $\angle R \cong \dots$ $\overline{NT} \rightarrow \dots$ $\angle N \cong \dots$ $\overline{CD} \rightarrow \dots$ $\angle C \cong \dots$
 $\overline{RS} \rightarrow \dots$ $\angle S \cong \dots$ $\overline{DE} \rightarrow \dots$ $\angle D \cong \dots$

Use the similar polygons above to write the statement of proportionality for each:

Complete the similarity statement for the similar figures and then find the **scale factor**. **REDUCE** fractions!

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$\Delta LKM \sim \Delta \dots$ $\Delta CBA \sim \Delta \dots$ $\Delta SPQ \sim \Delta \dots$
 Scale Factor: _____ Scale Factor: _____ Scale Factor: _____

$\Delta HJG \sim \Delta \dots$ $\Delta NPM \sim \Delta \dots$ $\Delta ME \sim \Delta \dots$
 Scale Factor: _____ Scale Factor: _____ Scale Factor: _____

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The two polygons are similar. Write a proportion and solve for x.

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Complete the similarity statement for the similar figures and then find the **scale factor**.
 Next, write proportions and **SOLVE** for the missing lengths.

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Are some triangles similar by the AA^c Postulate? **Prove** yes or no. If the triangles are similar, write a similarity statement.

-
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Similar: YES NO Similar: YES NO
 $\Delta ADE \sim \Delta \dots$ $\Delta EDF \sim \Delta \dots$

Find the angle measurements and set up proportions to find **all** missing side lengths. Notice the triangles are similar by AA^c.

- Flipped OR Twisted??**

 $m\angle A = \dots$ $m\angle C = \dots$ $m\angle D = \dots$
 Proportion to find x: _____ Proportion to find y: _____
- Flipped OR Twisted??**

 $m\angle A = \dots$ $m\angle ZM = \dots$ $m\angle T = \dots$
 Proportion to find x: _____ Proportion to find y: _____

Given two similar figures, find the **scale factor** and the **ratio of the perimeters** from the **SMALL** to the **BIG**.

- Scale Factor: _____ Ratio of Perimeters: _____
- Scale Factor: _____ Ratio of Perimeters: _____

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Geometry _____
CPCTC Worksheet _____
Name _____

1) What does the acronym CPCTC represent?

List all information given by the marks on the diagram. (There are at least 3 pieces of information for every problem.)

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Complete each congruence statement by naming the corresponding angle or side.

- $\Delta WXT \cong \Delta WYK$
- $\Delta UTS \cong \Delta UTS$
- $\Delta MZP \cong \Delta MZD$
- $\Delta LMN \cong \Delta LCD$
- $\Delta STU \cong \Delta EGF$
- $\Delta GH \cong \Delta HXY$

Write a statement that indicates that the triangles in each pair are congruent.

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