




September 4, 2018


Find x.  $85 + x + 35 = 180$

4)   $X = 60$

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

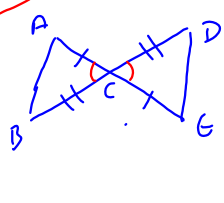
3)  AAS

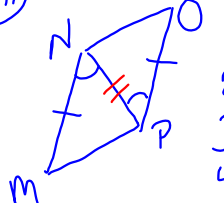
4)  NOT CONGRUENT

5)  SSS

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Quiz Review

8)  STATEMENTS REASONS  
 1  $\overline{AC} \cong \overline{EC}$  1 Given  
 2  $\overline{BC} \cong \overline{DC}$  2 Given  
 3  $\angle ACB \cong \angle DCE$  3 Vertical  $\angle$ s  
 4  $\triangle ABC \cong \triangle CDE$  4 SAS

11)  STATEMENTS 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 property  
 4  $\triangle MNP \cong \triangle OPN$  4 SAS

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Unit 2 Test Part 1 Study Guide

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

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

3. If  $m\angle 1 = 40^\circ$ ,  $m\angle 2 = 30^\circ$ , find  $m\angle 4$  and  $m\angle 5$ .  
 $180 - 70 = 110$

4. In the diagram below,  $m\angle 2 = 5(x+1)$ ,  $m\angle 3 = 40$ , and  $m\angle 4 = 3(x+5)$ . Find  $x$  and the measure of  $\angle 2$ .  
 $3(x+5) + 40 + 5(x+1) = 180$   
 $3x + 15 + 40 + 5x + 5 = 180$   
 $8x + 60 = 180$   
 $8x = 120$   
 $x = 15$   
 $m\angle 2 = 5(15+1) = 80$

5. Find  $m\angle 3$  if  $m\angle 1 = 3x+1$  and  $m\angle 2 = 2x+14$ .  
 $3x+1 = 2(x+7)$   
 $3x+1 = 2x+14$   
 $x = 13$   
 $m\angle 3 = 2(13)+14 = 40$

6. Find  $m\angle 1$  if  $m\angle 2 = 95^\circ$ .  
 Transversal  
 Alternate interior angles.  
 $m\angle 1 = 95$

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7.  $\triangle PQR$  and  $\triangle STU$  are congruent triangles. Using this information, list the corresponding sides and corresponding angles.  
 $PQ = ST$ ,  $QR = TU$ ,  $RP = US$   
 $\angle P = \angle S$ ,  $\angle Q = \angle T$ ,  $\angle R = \angle U$

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 which type of congruency.  
 a. SSS  
 b. SAS  
 c. ASA  
 d. It cannot be determined if the triangles are congruent.

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.  
 $\overline{AD} = \overline{BD}$   
 Vertical Angles  
 Reflexive property  
 SSS SAS HL

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

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

Step	Statements	Reasons
1	$\overline{NO} \perp \overline{MP}$ and $\overline{MN} \perp \overline{OP}$	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 property
5	$\triangle MNP \cong \triangle OPN$	ASA

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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 Given
1		
2	$\overline{AE} \cong \overline{EC}$	def of a midpoint
3	$\overline{DE} \cong \overline{BE}$	def of a midpoint
4	$\angle AEB \cong \angle CED$	SAS
5		

12.  $\triangle DEF$  and  $\triangle TVU$  are congruent triangles. Which statement is known to be true?  
 a.  $\overline{DE} \cong \overline{TU}$   
 b.  $\overline{DF} \cong \overline{TU}$   
 c.  $\angle V \cong \angle X$   
 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.  $\angle U \cong \angle V$   
 b.  $\angle W \cong \angle X$   
 c.  $\angle V \cong \angle X$   
 d.  $\angle V \cong \angle Y$

15. Name all angles for each description.  
 Corresponding: 4 & 3, 1 & 6, 3 & 8, 2 & 5  
 Alternate Interior: 1 & 2, 2 & 3  
 Alternate Exterior: 4 & 5, 3 & 6  
 Vertical: 1 & 4, 2 & 3, 5 & 8  
 Same side interior: 1 & 2, 2 & 3

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16. Identify all angle measures.  
 $41^\circ = \angle 6, \angle 1, \angle 3$   
 $180 - 41 = 139^\circ = \angle 5, \angle 7, \angle 2, \angle 4$

17. Determine whether each pair of triangles is congruent. If so, write a congruence statement and explain why the triangles are congruent.  
 $\triangle RSP \cong \triangle QSP$  SAS  
 $\triangle KJI \cong \triangle HGI$  AAS  
 $\triangle LMN \cong \triangle ONL$  HL  
 $\triangle ABC \cong \triangle DEF$  ASA

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 in which you can determine if the two triangles can be proven congruent. If so, how can the  $\triangle$ s be proved congruent?

Theorems about Lines and Angles

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

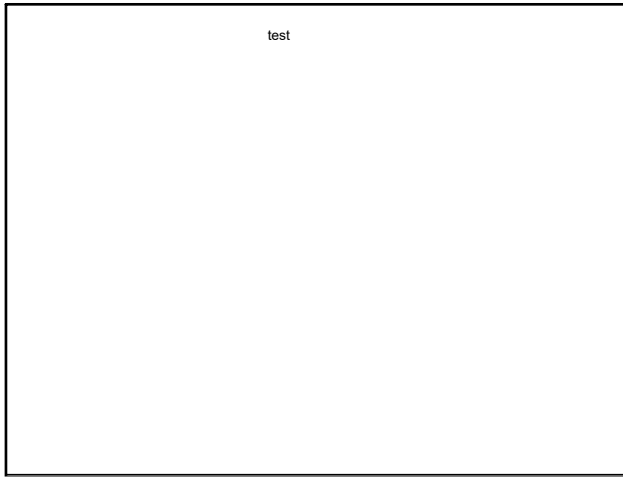
a.  $m\angle 1 = 2x+10$ ,  $m\angle 2 = 86+x$   
 $2x+10 = 86+x$   
 $x = 76$

b.  $m\angle 1 = 11x - 6$ ,  $m\angle 2 = 7x + 6$   
 $11x - 6 = 7x + 6$   
 $4x = 12$   
 $x = 3$

c.  $m\angle 1 = 4x + 24$ ,  $m\angle 2 = 7x + 33$   
 $4x + 24 = 7x + 33$   
 $-3x = 9$   
 $x = -3$

d.  $m\angle 1 = 6x + 7$ ,  $m\angle 2 = 3x + 38$   
 $6x + 7 + 3x + 38 = 180$   
 $9x + 45 = 180$   
 $9x = 135$   
 $x = 15$

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### 11.1 Dilations

**Essential Question:** How does a dilation transform a figure?

**Explore 1 Investigating Properties of Dilations**

A dilation is a transformation that can change the size of a polygon but leaves the 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.

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

1. 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

2. Use a protractor to measure the corresponding angles.

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

3. Complete the following ratios.

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

**Reflect**

- What do you notice about the corresponding sides of the figures? What do you notice about the corresponding angles?
- Discussion:** What similarities are there between reflections, rotations, and dilations? What is the difference?

Lesson 1  
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Name: \_\_\_\_\_ Date: \_\_\_\_\_

### 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.

- In Math, the word dilate means to \_\_\_\_\_ or \_\_\_\_\_ a figure.
- If a scale factor is less than 1, then your figure gets \_\_\_\_\_.
- 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.

$J:$  \_\_\_\_\_  $J':$  \_\_\_\_\_  
 $K:$  \_\_\_\_\_  $K':$  \_\_\_\_\_  
 $L:$  \_\_\_\_\_  $L':$  \_\_\_\_\_

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

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

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

6. Graph the dilated image of triangle  $XYZ$  using a scale factor of 1/3 and  $(0,0)$  as the center of dilation.

$X:$  \_\_\_\_\_  $X':$  \_\_\_\_\_  
 $Y:$  \_\_\_\_\_  $Y':$  \_\_\_\_\_  
 $Z:$  \_\_\_\_\_  $Z':$  \_\_\_\_\_

7. Graph the dilated image of quadrilateral  $MNOP$  using a scale factor of 1/3 and the origin as the center of dilation.

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

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

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

9. 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 $R'S'T'$
$R (-2, -3)$	$R' (-4, -6)$
$S (0, 2)$	$S' (0, 4)$
$T (2, -3)$	$T' (4, -6)$

**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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Name: \_\_\_\_\_ Date: \_\_\_\_\_

### 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 dilation with a scale factor of 1/4, centered at the origin.

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Name \_\_\_\_\_ Date \_\_\_\_\_

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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Name \_\_\_\_\_ Date \_\_\_\_\_

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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Name \_\_\_\_\_ Date \_\_\_\_\_

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: \_\_\_\_\_ Hours: \_\_\_\_\_

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  $\angle$  \_\_\_\_ DO matches with \_\_\_\_  
 $\angle O$  matches with  $\angle$  \_\_\_\_ IO corresponds with \_\_\_\_  
 $\angle G$  corresponds with  $\angle$  \_\_\_\_ SI matches with \_\_\_\_  
 Suppose  $\angle S = 25^\circ$ , what is the measure of  $\angle D$ ?

2. AHOT ~ AFIG

$\angle H$  corresponds with  $\angle$  \_\_\_\_ FI matches with \_\_\_\_  
 $\angle O$  matches with  $\angle$  \_\_\_\_ IG corresponds with \_\_\_\_  
 $\angle T$  corresponds with  $\angle$  \_\_\_\_ GP 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).

small  $\Delta$   $\frac{3}{5} = \frac{x}{z}$   
 big  $\Delta$   $\frac{4}{5} = \frac{y}{z}$

The missing side is \_\_\_\_\_  $x =$  \_\_\_\_\_

**Example 2:** The figures in each pair are similar

small  $\square$   $\frac{6}{8} = \frac{9}{x}$   
 big  $\square$   $\frac{9}{x} = \frac{12}{4}$

The missing side is \_\_\_\_\_  $x =$  \_\_\_\_\_

**Practice Problems**

Find the missing side(s) in each similar figure. Show Work!

- 
- 
- 
- 
- 
- 

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Geometry Assessment  
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.

2.  $\triangle PQR \sim \triangle DEF$       3.  $\triangle LMN \sim \triangle RST$       4.  $\square ABCD \sim \square EFGH$

$\overline{PQ} \rightarrow \angle Q = \angle D =$        $\overline{LM} \rightarrow \angle L = \angle R =$        $\overline{AB} \rightarrow \angle A =$   
 $\overline{QR} \rightarrow \angle R = \angle F =$        $\overline{MN} \rightarrow \angle M = \angle S =$        $\overline{BC} \rightarrow \angle C =$   
 $\overline{PR} \rightarrow \angle R = \angle F =$        $\overline{LN} \rightarrow \angle N =$        $\overline{CD} \rightarrow \angle C =$   
 $\overline{DE} \rightarrow \angle D = \angle D =$

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!

5.  $\triangle LKM \sim \triangle$  \_\_\_\_\_      6.  $\square CBAD \sim$  \_\_\_\_\_      7.  $\square RSPQ \sim$  \_\_\_\_\_

8.  $\triangle HJG \sim \triangle$  \_\_\_\_\_      9.  $\triangle NPM \sim \triangle$  \_\_\_\_\_      10.  $\square KJME \sim$  \_\_\_\_\_

Scale Factor: \_\_\_\_\_      Scale Factor: \_\_\_\_\_      Scale Factor: \_\_\_\_\_

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

11.

12.

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

14.  $\triangle LKM \sim \triangle$  \_\_\_\_\_      15.  $\triangle HJG \sim \triangle$  \_\_\_\_\_

16.  $\square KJME \sim$  \_\_\_\_\_      17.  $\triangle HJG \sim \triangle$  \_\_\_\_\_

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Are these triangles similar by the AA<sup>c</sup> Postulate? **YES** or **NO**. If the triangles are similar, write a similarity statement.

18.

Similar: YES NO  
 $\triangle ADE \sim \triangle$  \_\_\_\_\_

19.

Similar: YES NO  
 $\triangle EDF \sim \triangle$  \_\_\_\_\_

Find the angle measurements and set up proportions to find all missing side lengths. Notice the triangles are similar by AA<sup>c</sup>.

20. Flipped OR Twisted??

$m\angle A =$  \_\_\_\_\_  $m\angle C =$  \_\_\_\_\_  $m\angle D =$  \_\_\_\_\_  
 Proportion to find x: \_\_\_\_\_      Proportion to find y: \_\_\_\_\_

21. Flipped OR Twisted??

$m\angle A =$  \_\_\_\_\_  $m\angle B =$  \_\_\_\_\_  $m\angle C =$  \_\_\_\_\_  
 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**.

22.

Scale Factor: \_\_\_\_\_      Ratio of Perimeters: \_\_\_\_\_

23.

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.)

2)

3)

4)

5)

6)

7)

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

8)  $\triangle WXT \cong \triangle WYX$       9)  $\triangle UTS \cong \triangle UTS$

$\angle YWX \cong ?$        $\angle T \cong ?$

10)  $\triangle QZY \cong \triangle QZD$       11)  $\triangle LMN \cong \triangle LCN$

$\angle Y \cong ?$        $\overline{LM} \cong ?$

12)  $\triangle FTU \cong \triangle EGF$       13)  $\triangle LKJ \cong \triangle JKL$

$\angle F \cong ?$        $\angle J \cong ?$

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

14)

15)

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