UNIT 8: Similarity, Congruence and Proofs
Accelerated CCGPS Algebra/Geometry

Standards:

- Understand similarity in terms of similarly transformations
- Prove theorems involving similarity
- Understand congruence in terms of rigid motions
- Prove geometric theorems
- Make geometric constructions

Date	Topic	Assignment
Friday 3-4	Dilations Investigations Pages 1-6	Finish investigation
Monday 3-7	Dilations Practice Pages 7-10	Finish through page 10
Tuesday 3-8	Similar Figures Pages 11-13	Finish through page 13
Wednesday 3-9	Pythagorean theorem to prove similar Pages 14 and 15	Finish through page 15
Thursday 3-10	Lines cut by transversals and their angles Pages 16-18	Finish through page 18
Friday 3-11	Unit 8 Application Problems Using maps OR STATIONS	
Monday 3-14	Lines cut by transversals and their angles Pages 19-21	Finish through page 21
Tuesday 3-15	CFA	Review sheet
Wednesday 3-16	Dilations, Similar Figures, Lines Cut by Transversals and their Angles TEST 8A	

Dilations Investigation—Student Activity

Name: _____ Geometry

Dilations – Part I

1. On the picture below, draw rays from O through each vertex of ΔABC.
2. Use patty paper to measure the length of $\overline{OA}$. Place A' on $\overrightarrow{OA}$ so that $OA' = 2 \bullet OA$
3. Use the same process to find B' and C'.
4. Draw $\Delta A'B'C'$.
5. Trace ΔABC on a piece of patty paper. Compare the angles of ΔABC with the angles of $\Delta A'B'C'$. What do you notice about the angle measures?

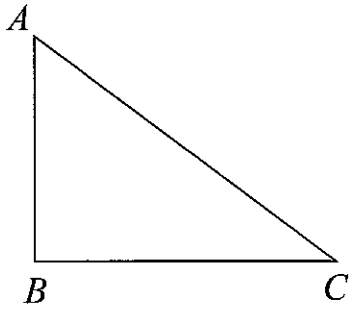
   _____
6. Use a ruler to find the following lengths in centimeters.

   a. $AB =$ _____ d. $A'B' =$ _____

   b. $BC =$ _____ e. $B'C' =$ _____

   c. $AC =$ _____ f. $A'C' =$ _____
7. What do you notice about the lengths of the sides of the two triangles?

   _____
8. The **Scale Factor** for this dilation is _____.



O
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9. Use your patty paper to transfer ΔABC and $\Delta A'B'C'$ to the grid paper with point O at the origin. Write the ordered pairs next to each vertex on the grid paper and in Table 1 below. What do you notice about these ordered pairs?

_____

_____

10. Dilate ΔABC using a scale factor of 3 on your grid paper. Label the new triangle $\Delta A''B''C''$. Write the ordered pairs next to each vertex and in Table 1 below.

11. Dilate ΔABC using a scale factor of $\frac{1}{2}$ on your grid paper. Label the triangle $\Delta A'''B'''C'''$. Write the ordered pairs next to each vertex and in Table 1 below.

Table 1 – Ordered Pairs

Original Triangle		Dilation (Scale Factor of 2)		Dilation (Scale Factor of 3)		Dilation (Scale Factor of $\frac{1}{2}$)	
A		A'		A''		A'''	
B		B'		B''		B'''	
C		C'		C''		C'''	

12. What observations/conjectures can you make about dilations and ordered pairs based on your work so far?

13. Complete this conjecture based on Table 1: The image of (a, b) after a dilation with center O and scale factor k has coordinates (_____, _____).

Dilations Investigation—Student Activity

Name: _____ Geometry

Dilations – Part II

7. Record your observations about the characteristics of the triangles ΔABC and $\Delta A'B'C'$ from **Dilations – Part I** in the table below.

Characteristics	Original ΔABC	$\Delta A'B'C'$ (Scale Factor of 2)	Observations
Coordinates	A(3, 5) B(3, 2), C(7, 2)		
Angle Measures			
Length of Sides			
Perimeter			
Area			

8. Graph Quadrilateral *JKLM* on the back of your grid paper (from **Part I**). Dilate quadrilateral *JKLM* with a scale factor of 3 on your grid paper. Label the image $J'K'L'M'$ and complete the table below.

Characteristics	Original *JKLM*	Quad. $J'K'L'M'$ (Scale Factor of 3)	Observations
Coordinates	J(-2, 1) K(-2, 3), L(3, 3), M(3, 1)		
Angle Measures			
Length of Sides			
Perimeter			
Area			

9. Graph Quadrilateral *QRST* on the same grid paper. Dilate quadrilateral *QRST* with a scale factor of $\frac{1}{2}$ on your grid paper. Label the image $Q'R'S'T'$ and complete the table below.

Characteristics	Original *QRST*	Quad. $Q'R'S'T'$ (Scale Factor of $\frac{1}{2}$)	Observations
Coordinates	Q(-2, -2) R(-2, -4), S(-6, -4), T(-6, 2)		
Angle Measures			
Length of Sides			
Perimeter			
Area			

10. A diameter of a circle has endpoints A and B. Graph the circle on your grid paper. Dilate the circle with a scale factor of 2. Label the coordinates of the image A' and B' and complete the table below.

Characteristics	Original circle with diameter $\overline{AB}$	New circle with diameter $\overline{A'B'}$	Observations
Coordinates	$A(4,1)$, $B(4,-3)$		
Length of the diameter			
Length of the radius			
Circumference			
Area			

11. Based on the information in all four tables, what conjectures can you make about:

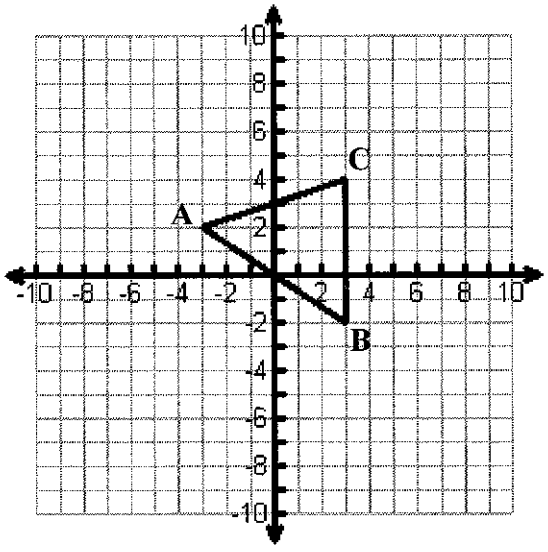
e. Scale Factor used in the dilation and angle measures _____

f. Scale Factor used in the dilation and side lengths/diameter. _____

g. Scale Factor used in the dilation and perimeter/circumference. _____

h. Scale Factor used in the dilation and area. _____

12. Use the graph to below to answer the following dilation questions.



a) Find the coordinates of triangle $A'B'C'$ after a dilation with a scale factor of 3.

_____

How does this change angle measures?

_____

b) Find the coordinates of triangle $A'B'C'$ after a dilation with a scale factor of $\frac{3}{2}$.

_____

How does this change the lengths of the sides?

_____

c) If the coordinates of A' are (-1.5, 1) after a dilation, find the coordinates of B' and C'?

_____

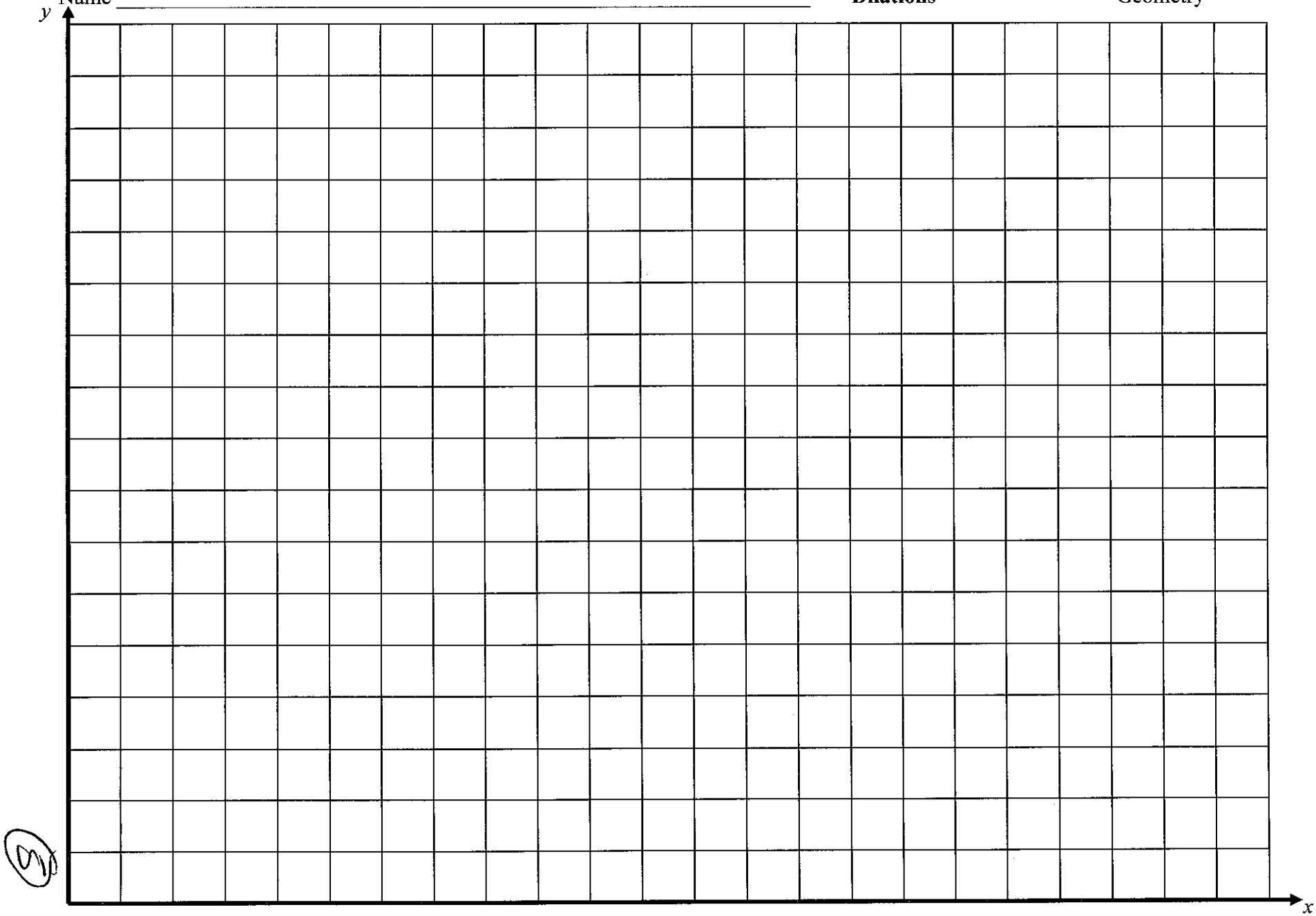
How does this change the perimeter of the triangle? _____

d) If the coordinates of B' are (18, -12) after a dilation, find the coordinates of A' and C'? _____

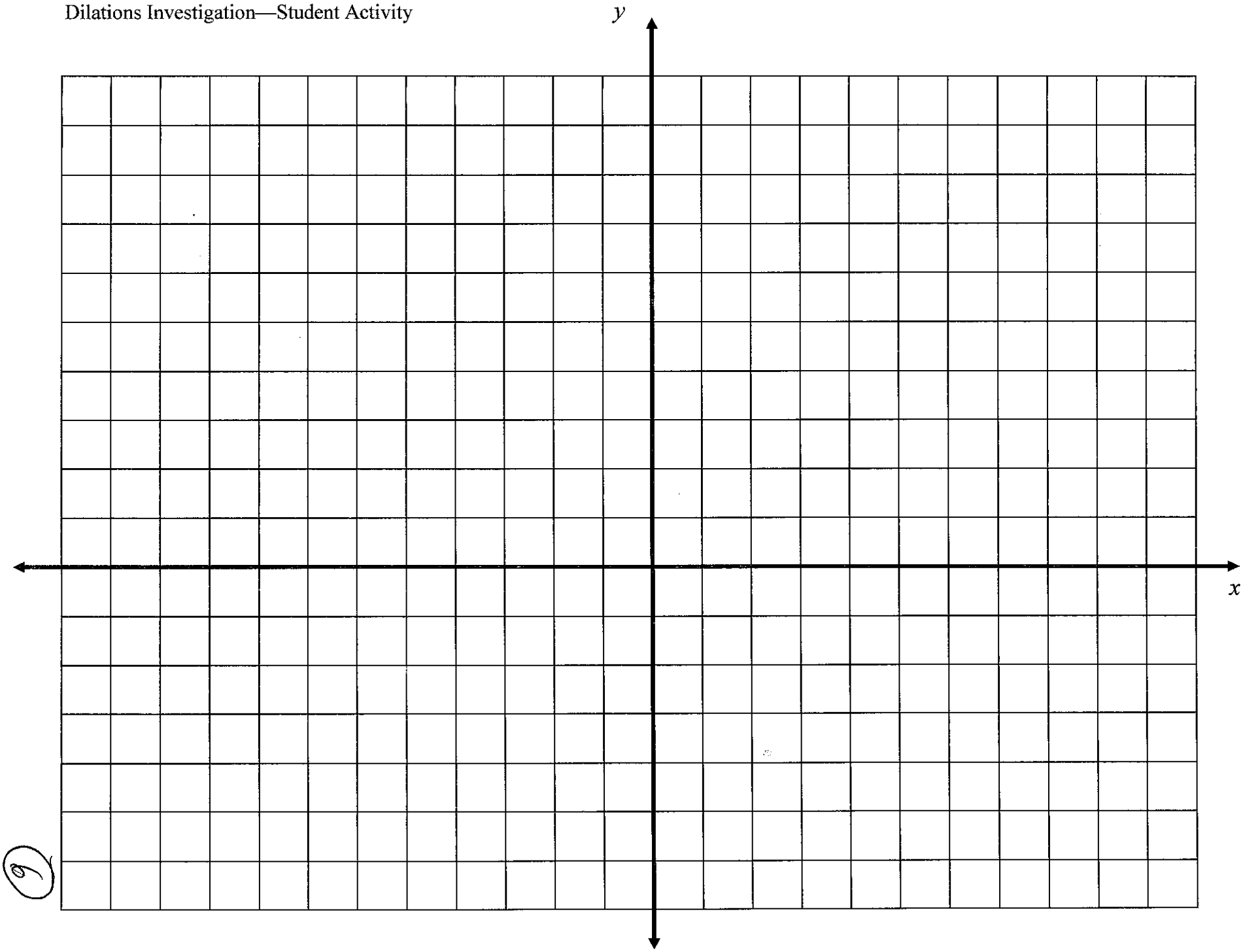
How does this change the area of the triangle? _____

Dilations Investigation—Student Activity

Name _____ **Dilations** Geometry



Dilations Investigation—Student Activity



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Dilations Investigation—Homework

Geometry

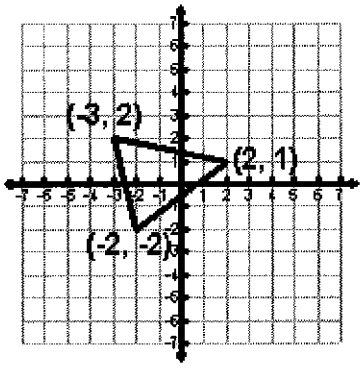
Dilation WS

Name: _____

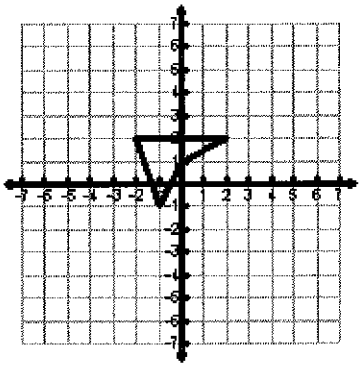
Date:_____Per.: _____

Dilate the following with the given scale factors.

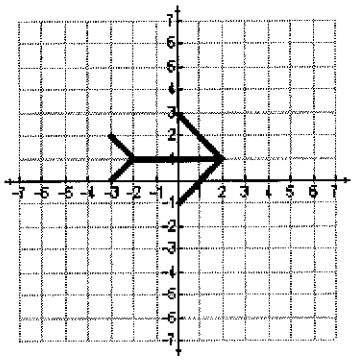
1) scale factor = 2



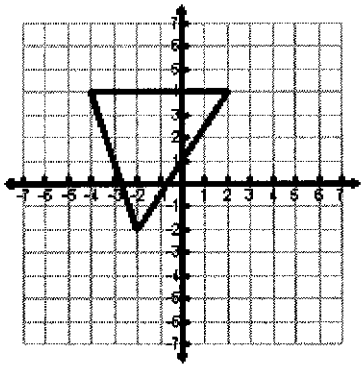
2) scale factor = 3



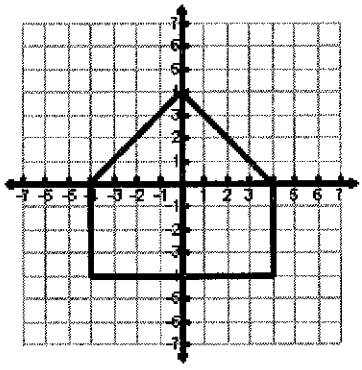
3) scale factor = 2



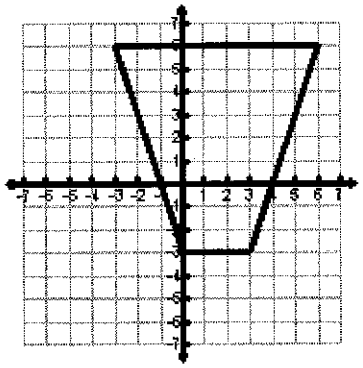
4) scale factor = $\frac{3}{4}$



5) scale factor = $\frac{3}{2}$

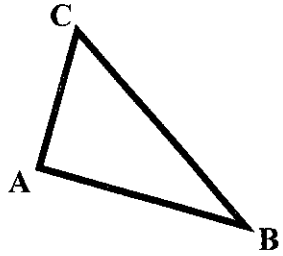


6) scale factor = $\frac{2}{3}$



Dilate the following triangles with the given scale factors.

7) S_2



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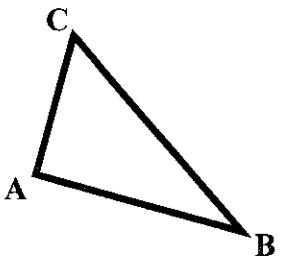
7

8) S_3



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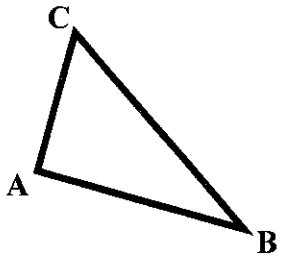
9) $S_{\frac{3}{2}}$



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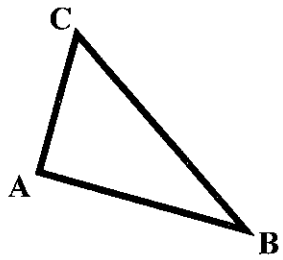
10) $S_{\frac{1}{2}}$



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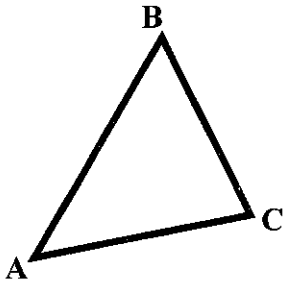
11) S_2



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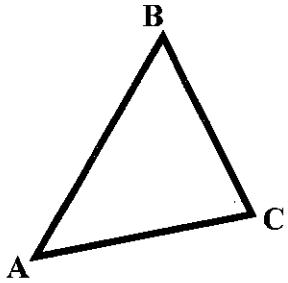
12) $S_{\frac{2}{3}}$



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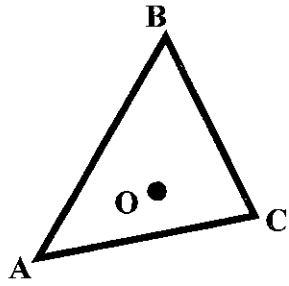
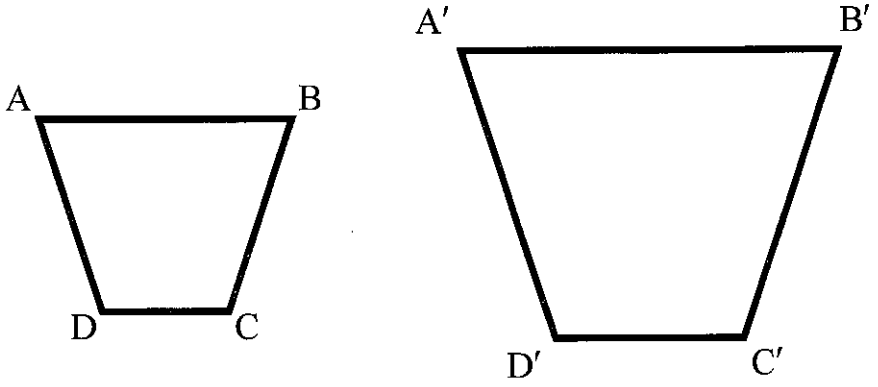
13) S_{-3}



14) Use a ruler to find the scale factor of the following dilation. _____



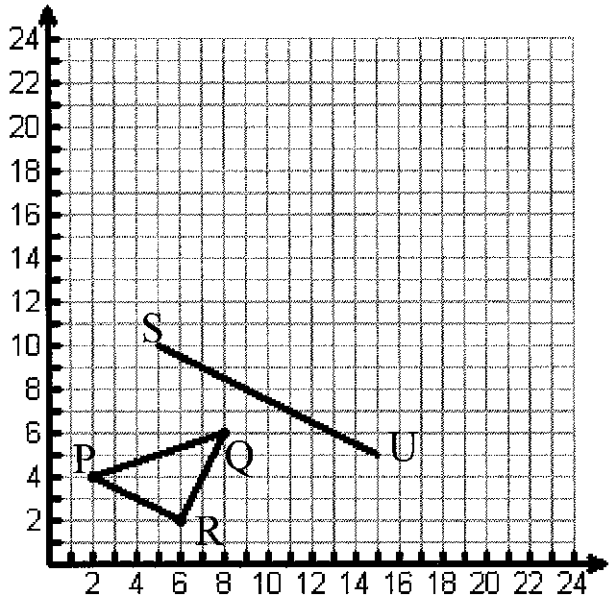
a) How does the dilation change the angles measures? _____

b) How does the dilation change the length of the sides? _____

c) How does the dilation change the perimeter? _____

d) How does the dilation change the area? _____

15) The graph shows Δ PQR with vertices P (2, 4), Q (8, 6), and R (6, 2) and $\overline{SU}$ with endpoints S (5, 10) and U (15, 5).



At what coordinates would vertex T be placed to create Δ STU, a triangle that is a dilation of Δ PQR?

F (12, 9)
G (16, 12)
H (20, 15)
J (24, 18)

10

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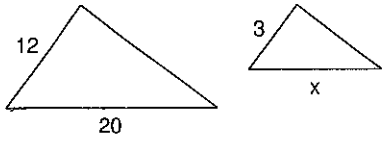
Name_____

Similar Figures

Date_____ Period____

Each pair of figures is similar. Find the missing side. & measure all the angles for #'s 1-8. What do you notice

1)



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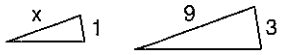

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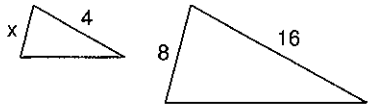

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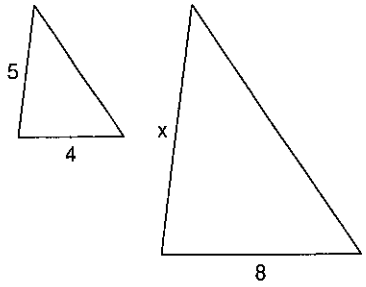

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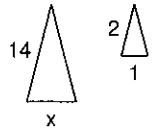

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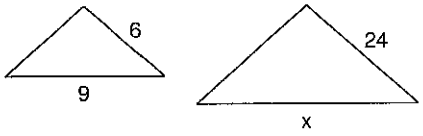

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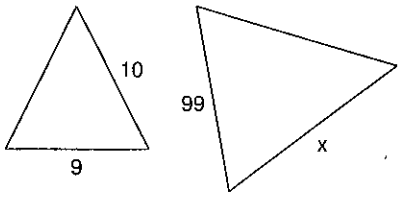

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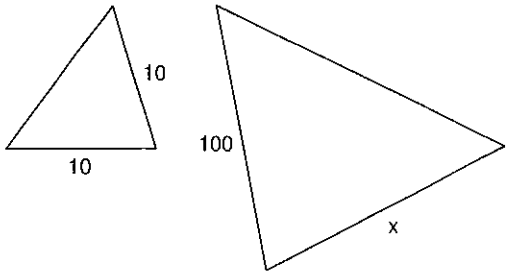
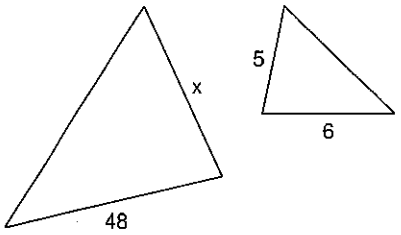


(11)

9)



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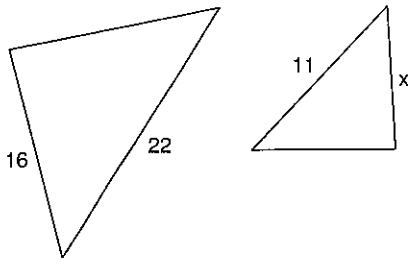

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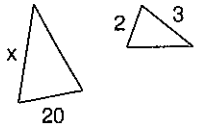

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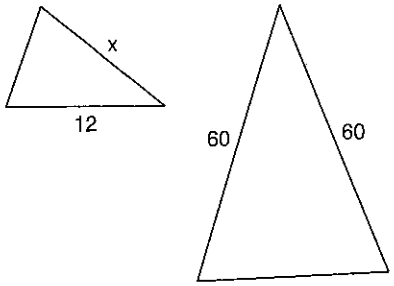

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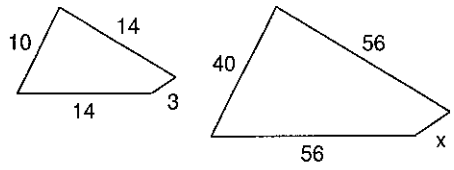

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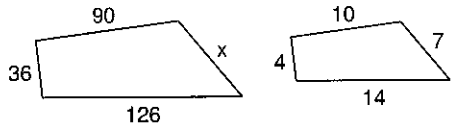

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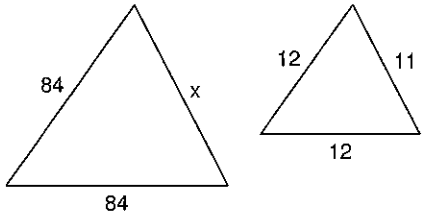

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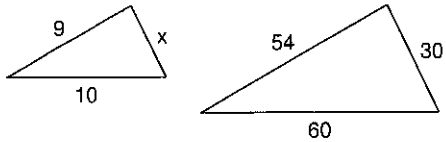

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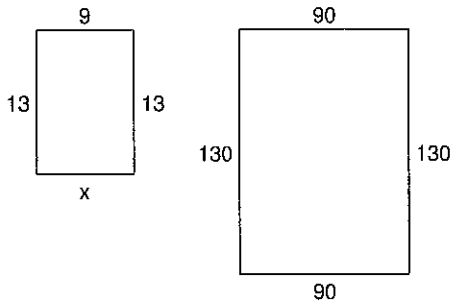

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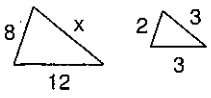

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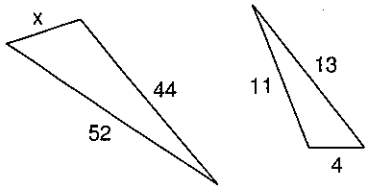

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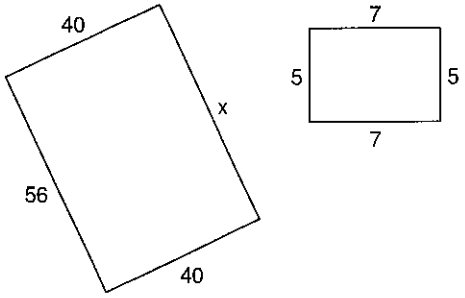

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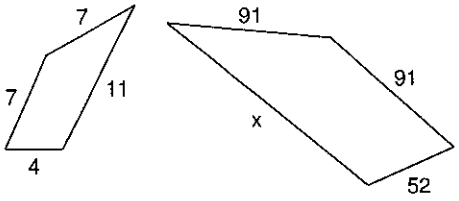

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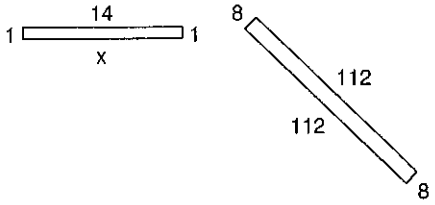

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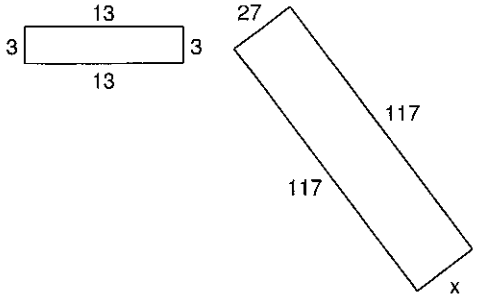

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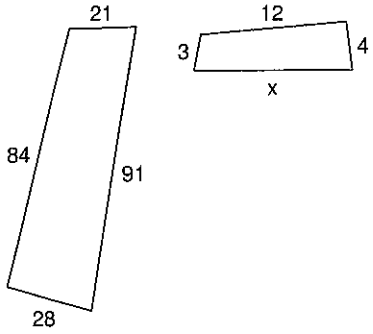

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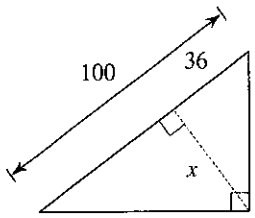
Name_____

Similar Right Triangles

Date_____ Period____

Find the missing length indicated. Leave your answer in simplest radical form.

1)



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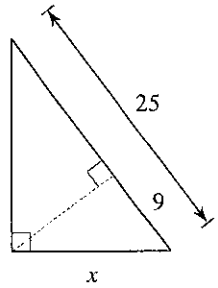

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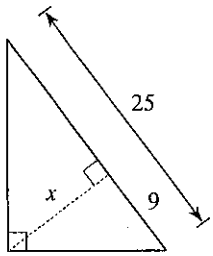
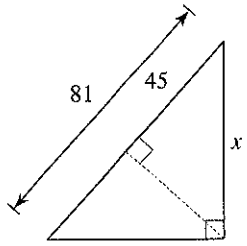


4)



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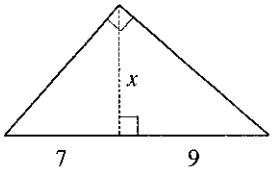

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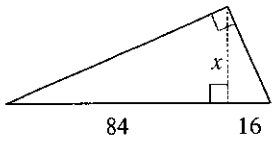
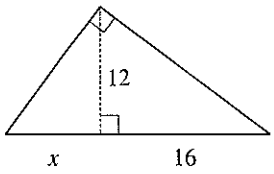
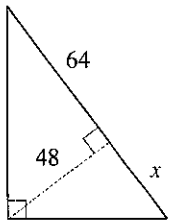


7)

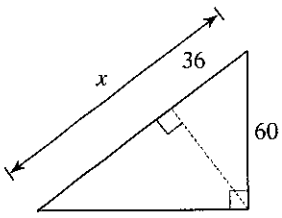


8)



14

9)



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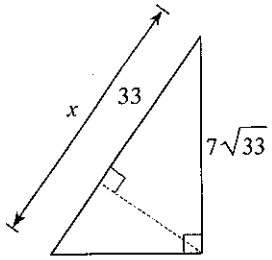
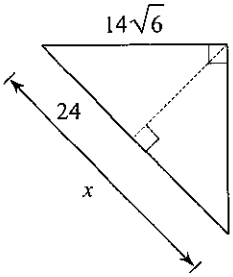
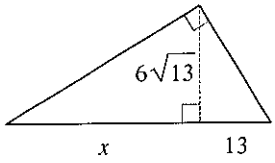


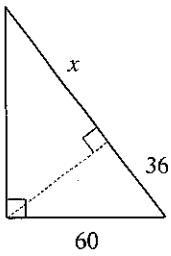
11)



12)



13)



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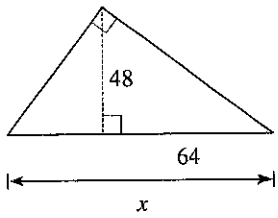

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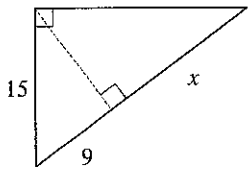

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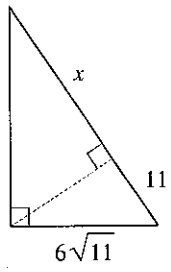
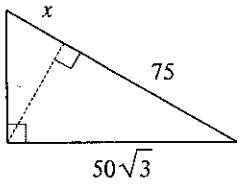


17)



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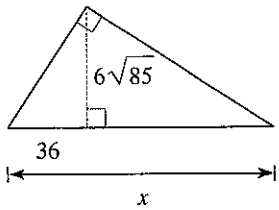


15

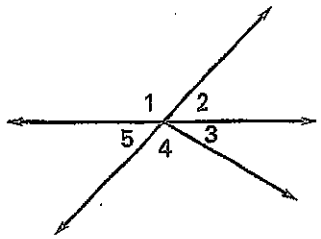
1.6

NAME WS 1.6 DATE

Practice B

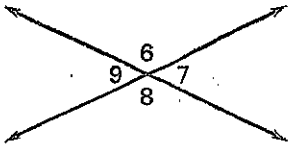
For use with pages 44–50

Use the figure at the right.



1. Are $\angle 1$ and $\angle 2$ a linear pair?
2. Are $\angle 4$ and $\angle 5$ a linear pair?
3. Are $\angle 3$ and $\angle 1$ vertical angles?
4. Are $\angle 2$ and $\angle 5$ vertical angles?

Use the figure at the right.



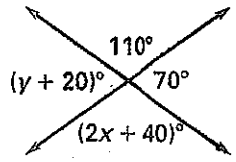
5. If $m\angle 6 = 51°$, then $m\angle 7 =$?.
6. If $m\angle 8 = 103°$, then $m\angle 6 =$?.
7. If $m\angle 9 = 136°$, then $m\angle 8 =$?.
8. If $m\angle 7 = 53°$, then $m\angle 9 =$?.

In Exercises 9–12, assume $\angle A$ and $\angle B$ are complementary and $\angle B$ and $\angle C$ are supplementary.

9. If $m\angle A = 48°$, then $m\angle B =$? and $m\angle C =$?.
10. If $m\angle B = 83°$, then $m\angle A =$? and $m\angle C =$?.
11. If $m\angle C = 127°$, then $m\angle B =$? and $m\angle A =$?.
12. If $m\angle A = 45°$, then $m\angle B =$? and $m\angle C =$?.

Find the value(s) of the variable(s).

13.



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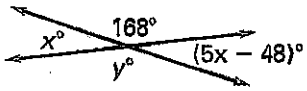

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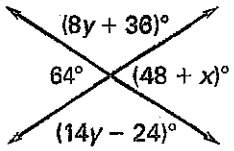

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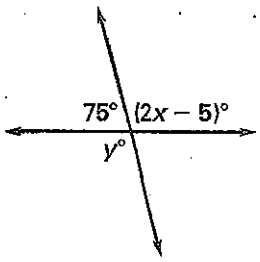

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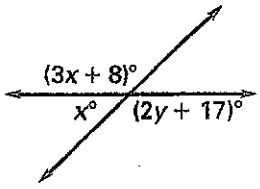

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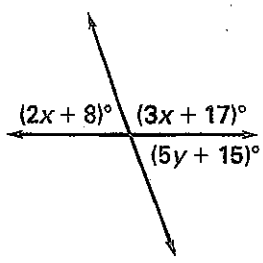


In Exercises 19 and 20, assume that $\angle A$ is supplementary to $\angle B$ and complementary to $\angle C$. Determine $m\angle A$, $m\angle B$, and $m\angle C$.

19. $m\angle A = x°, m\angle B = (x + 40)°, m\angle C = (x - 50)°$
20. $m\angle A = x°, m\angle B = (2x)°, m\angle C = (x - 30)°$

16

LESSON 3.3

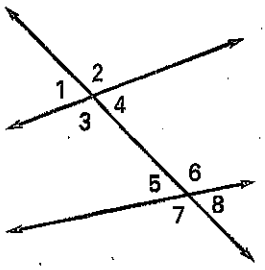
NAME WS 71 DATE

Practice A

For use with pages 143–149

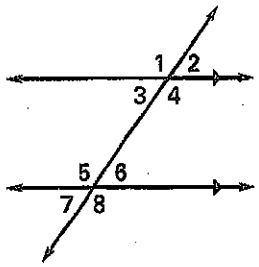
Name the relationship between the pair of angles.

1. $\angle 1$ and $\angle 5$
2. $\angle 2$ and $\angle 7$
3. $\angle 3$ and $\angle 6$
4. $\angle 8$ and $\angle 5$
5. $\angle 4$ and $\angle 6$
6. $\angle 8$ and $\angle 4$



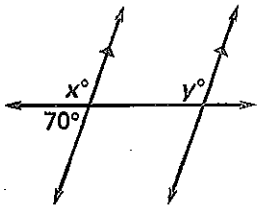
State the postulate or theorem that justifies the statement.

7. $\angle 3 \cong \angle 7$
8. $\angle 3 \cong \angle 6$
9. $\angle 2 \cong \angle 7$
10. $m\angle 4 + m\angle 6 = 180°$

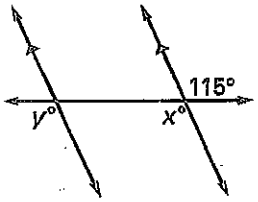


Find the values of x and y.

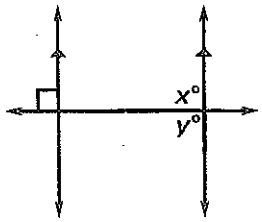
11.



12.



13.



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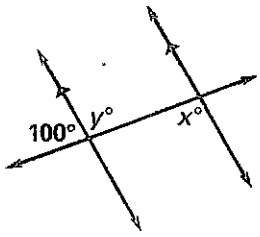

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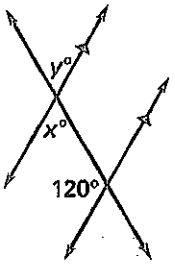
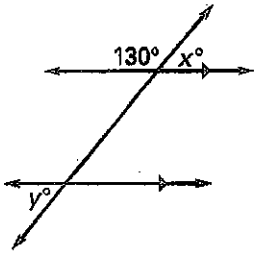
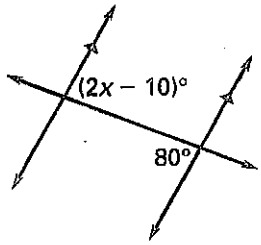


16.



Find the value of x.

17.



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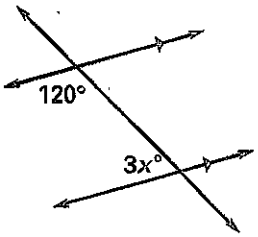

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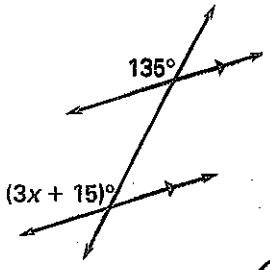


17

Lesson 3.3

LESSON 3.3

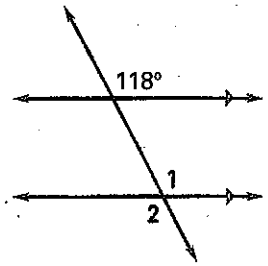
NAME _____ DATE _____

Practice B

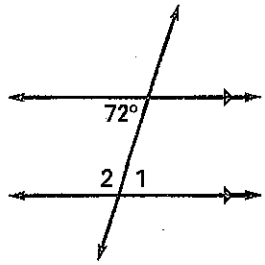
For use with pages 143–149

Find $m\angle 1$ and $m\angle 2$. Explain your reasoning.

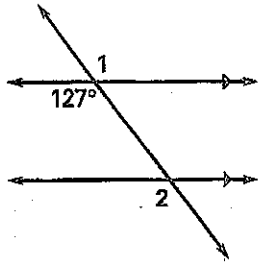
1.



2.

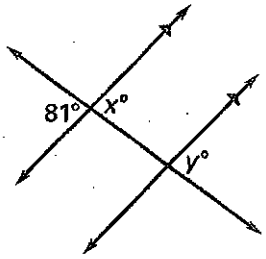


3.

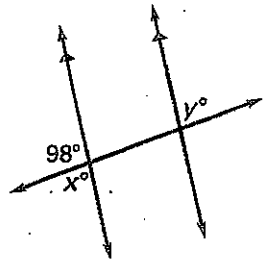


Find the values of x and y.

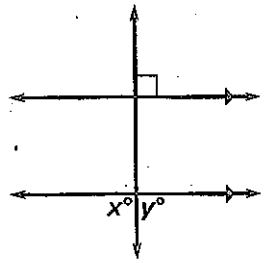
4.



5.

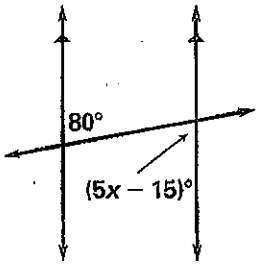


6.

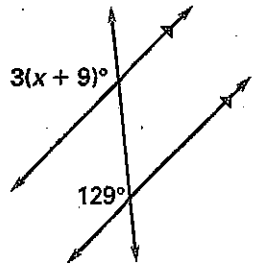


Find the value of x.

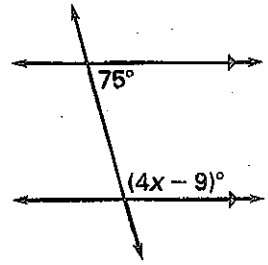
7.



8.



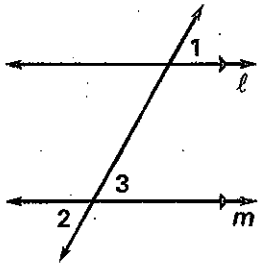
9.



10. Complete the flow proof of the Alternate Exterior Angles Theorem.

Given: $\ell \parallel m$

Prove: $\angle 1 \cong \angle 2$



$\ell \parallel m$

a. _____

$\angle 1 \cong \angle 3$

b. _____

$\angle 3 \cong \angle 2$

c. _____

$\angle 1 \cong \angle 2$

d. _____

Lesson 3.3

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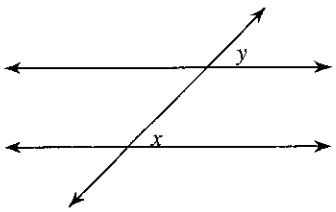
 Name_____

Parallel Lines and Transversals

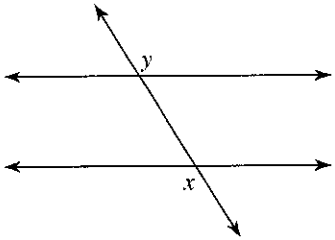
Date_____ Period____

Identify each pair of angles as corresponding, alternate interior, alternate exterior, or consecutive interior.

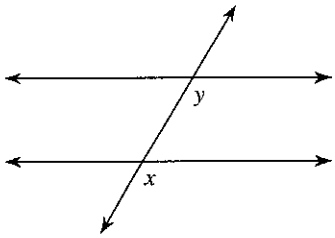
1)



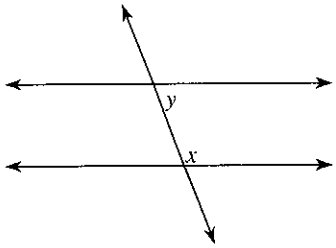
2)



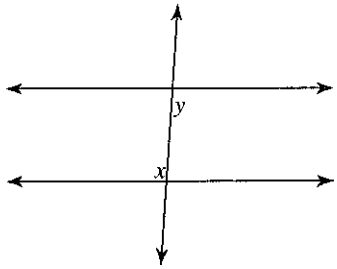
3)



4)



5)



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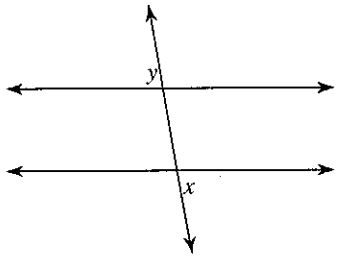

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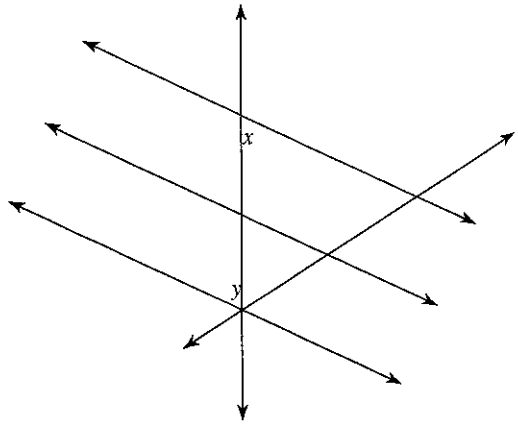

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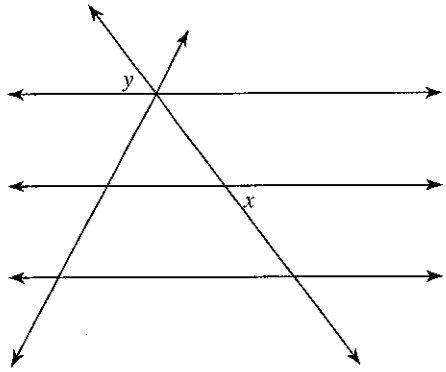

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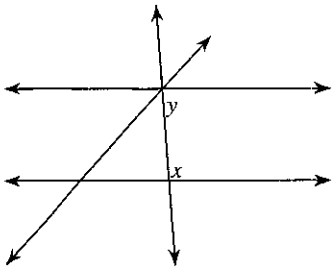
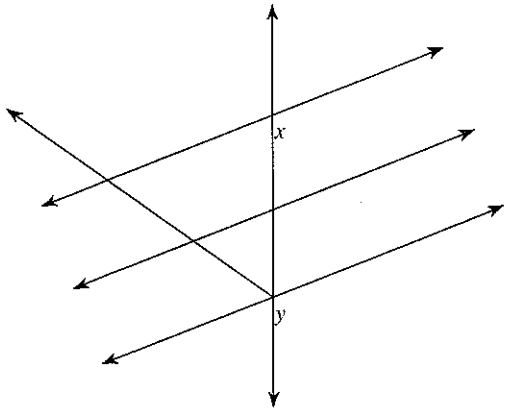
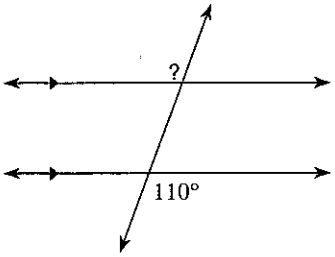


10)

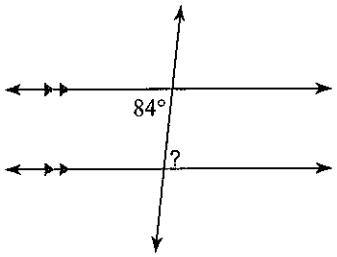


Find the measure of each angle indicated.

11)



12)



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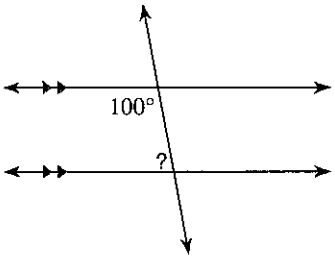

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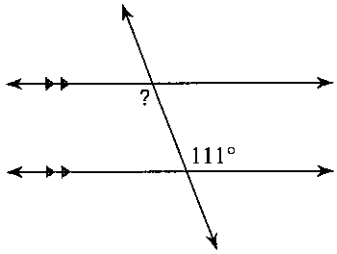

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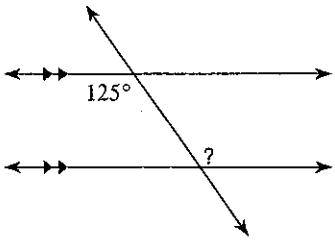

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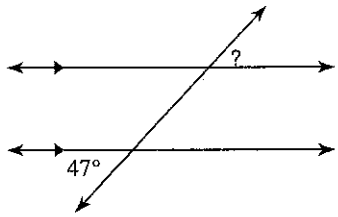

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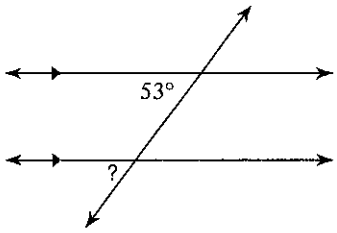

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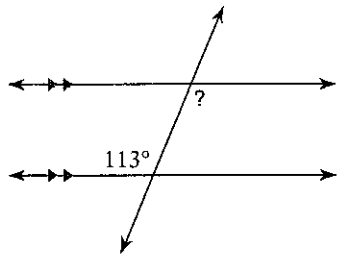
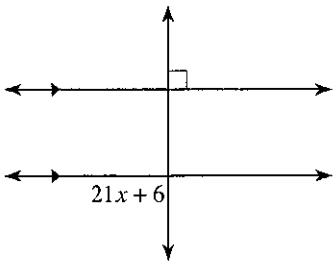


20

Solve for x.

19)



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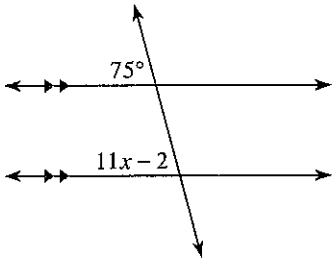

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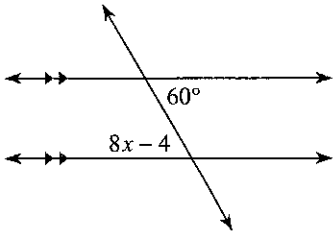

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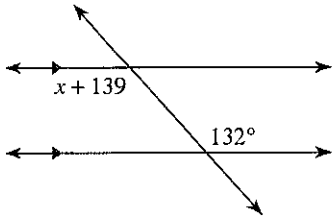

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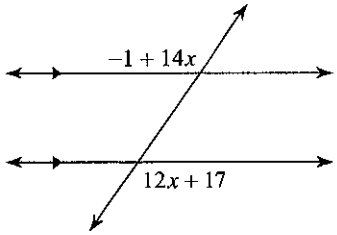

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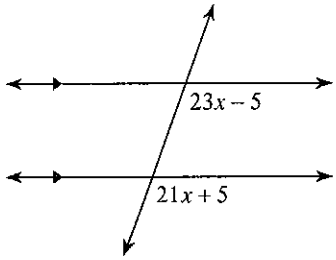
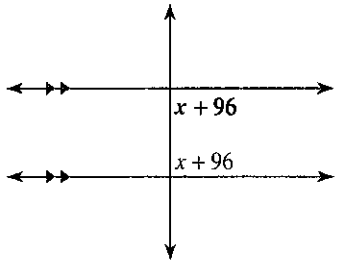
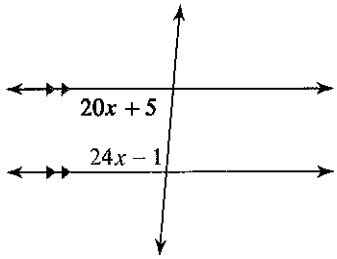


Find the measure of the angle indicated in bold.

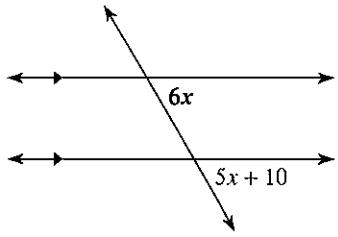
25)



26)



27)



28)