# Mr. Wilfong's Snow Packet

# Math: Geometry

# Days 22-31

**Instructions: Read ALL instructions carefully.**

1. This document contains Days 22-31 packet assignments for this class.

2. Be sure to follow all directions on the pages below and given by your teacher in class. You may be asked to turn in work on your own paper or digitally.

# Right Triangles CHEAT Sheet #1

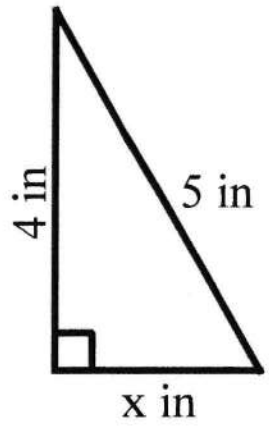
*When you have a problem involving a right triangle, there are 3 ways you can choose from to solve. Choose the best option for the information given.*

## OPTION 1: PYTHAGOREAN THEOREM-SIDES ONLY

- When you have two sides of a right triangle and you are trying to find a 3rd side
- When you are trying to determine whether 3 sides form a right triangle

### EXAMPLE #1

*Solve for x.*




$$a^2 + b^2 = c^2$$
$$x^2 + 4^2 = 5^2$$
$$x^2 + 16 = 25$$
$$x^2 = 9$$
$$x = 3$$

### EXAMPLE #2

*Will side lengths of 10, 8 and 6 form a right triangle?*

$$6^2 + 8^2 = 10^2$$
$$36 + 64 = 100$$
$$100 = 100$$

*Yes*

IF THE LEFT SIDE OF THE EQUATION ABOVE DID NOT EQUAL THE RIGHT SIDE, THE ANSWER WOULD BE NO.

# Right Triangles CHEAT Sheet #2

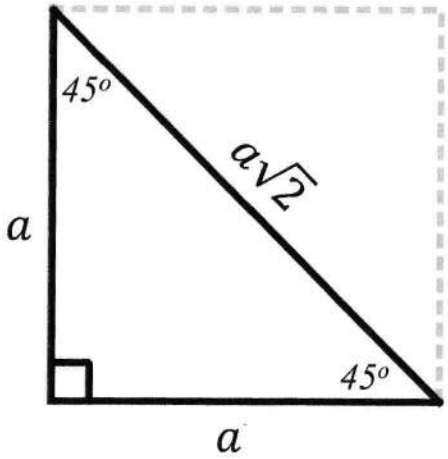
*When you have a problem involving a right triangle, there are 3 ways you can choose from to solve. Choose the best option for the information given.*

## OPTION 2: SPECIAL RIGHT TRIANGLES

- When you have a right triangle with a 45° angle OR a right triangle that is isosceles
- When you have a right triangle with a 30° or 60° angle
- When you are trying to find the diagonal of a square
- When you are trying to find the altitude of an equilateral triangle

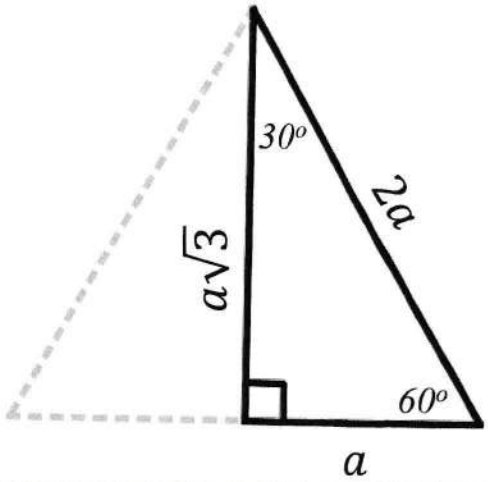
### 45-45-90

| 45° | 45° | 90° |
|---|---|---|
| $a$ | $a$ | $a\sqrt{2}$ |
| | | |




### 30-60-90

| 30° | 60° | 90° |
|---|---|---|
| $a$ | $a\sqrt{3}$ | $2a$ |
| | | |



# Angles in Triangles CHEAT Sheet

## ANGLE SUM THEOREM

*The sum of the interior angles of a triangle equal 180°.*

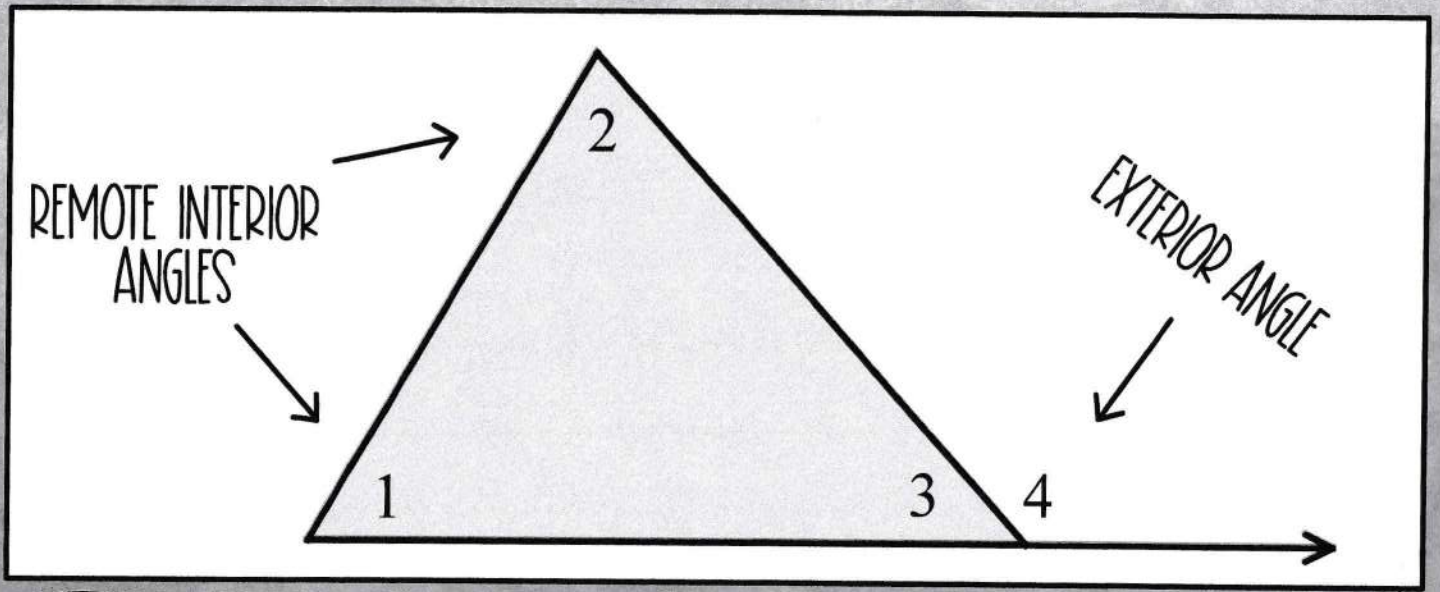
So, in the triangle below:
$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$



## EXTERIOR ANGLE THEOREM

*The exterior angle of a triangle is equal to the sum of the measure of the two remote interior angles. The remote interior angles are the two angles in the triangle that ARE NOT adjacent to the exterior angle you are trying to find.*

In the triangle below, $\angle 4$ is the exterior angle, so:
$m\angle 1 + m\angle 2 = m\angle 4$



# Triangle Inequalities CHEAT Sheet

## TRIANGLES

*Problem:*
Given 3 segment lengths, will they make a triangle?

*Solution:*
Add the measures of the two smallest sides. They MUST be GREATER THAN the third side to form a triangle.

## RIGHT TRIANGLES

*Problem:*
Given 3 segment lengths, will they make a right triangle?

*Solution:*
The word RIGHT tells us to use the Pythagorean Theorem. Make sure your longest side is substituted in for c! If the measures "fit," then they form a right triangle.

## RANGE

*Problem:*
Given two sides if a triangle, what could the length of the 3rd side be?

*Solution:*
Subtract the two numbers.
Add the two numbers.
These numbers give you the bound of the range.
Given two sides of a RIGHT triangle, use the Pythagorean Theorem!

## ORDERING

*Problem:*
Given the sides of a triangle, list the angles in order of size. OR, given the angles of a triangle, list the sides in order of size.

*Solution:*
The smallest angle is across from the shortest side.
The largest angle is across from the largest side.

# Congruent Triangles CHEAT Sheet

## CONGRUENT TRIANGLES

- Corresponding congruent angles
- Corresponding congruent sides

$\cong$

## CONGRUENCY STATEMENTS

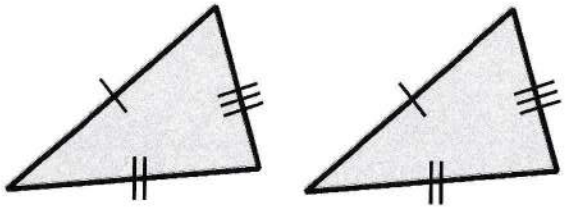
Congruency statements help to match up corresponding sides and corresponding angles in congruent triangles.

$\Delta ABC \cong \Delta DEF$

- Single letters in the same position represent congruent angles.
- Double letters in the same position represent congruent sides.

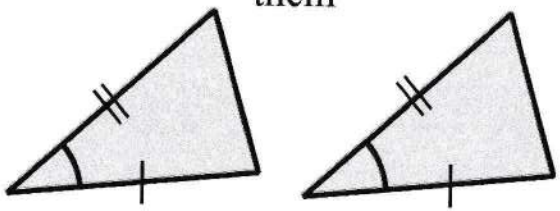
## SIDE, SIDE, SIDE

All 3 sides congruent



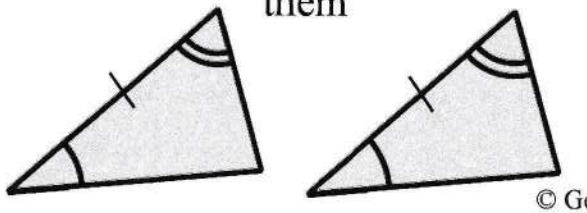
## SIDE, ANGLE, SIDE

Two sides congruent and the angle in between them



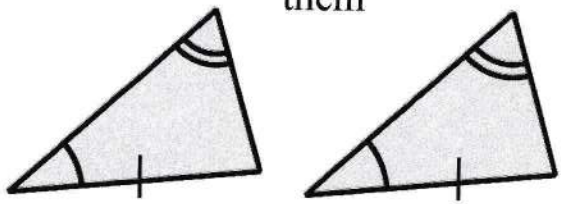
## ANGLE, SIDE, ANGLE

Two angles congruent and the side in between them



## ANGLE, ANGLE, SIDE

Two angles congruent and a side NOT between them



# Similar Triangles CHEAT Sheet #1

## SIMILAR TRIANGLES

- Corresponding congruent angles
- Corresponding proportional sides

$\sim$

## SIMILARITY STATEMENTS

Similarity statements help to match up corresponding sides and corresponding angles in similar triangles.

$\Delta ABC \sim \Delta DEF$

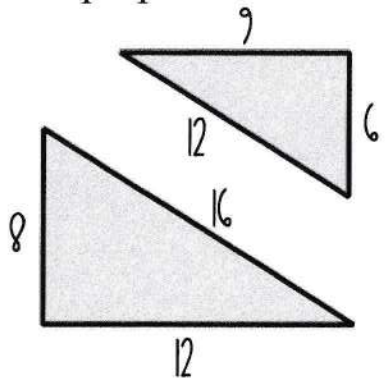
- Single letters in the same position represent congruent angles.
- Double letters in the same position represent proportional sides. They should reduce to the same fraction

## SIMILAR FIGURE TIPS

- Proportional means "reduce to the same fraction"
- When you see the word similar in a problem, there is a good chance you should be writing a proportion. Look for corresponding pieces of information to write one!

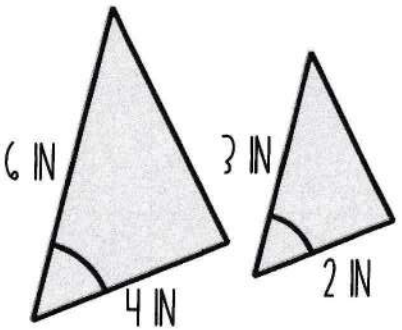
## SIDE, SIDE, SIDE

All 3 corresponding sides proportional



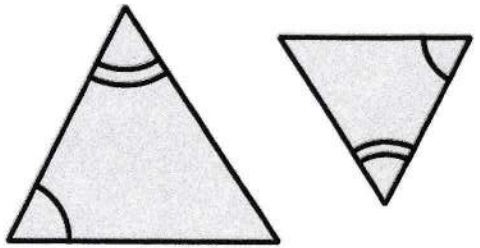

## SIDE, ANGLE, SIDE

Two sides proportional and the angle in between them




## ANGLE, ANGLE

Two angles congruent



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Name_____

# Solving Proportions

Date_____ Period____

**Solve each proportion. Leave your answer as a fraction in simplest form.**

1) $\frac{6}{2} = \frac{4}{p}$

2) $\frac{4}{k} = \frac{8}{2}$

3) $\frac{n}{4} = \frac{8}{7}$

4) $\frac{5}{3} = \frac{x}{4}$

5) $\frac{m}{5} = \frac{7}{2}$

6) $\frac{7}{4} = \frac{r}{5}$

7) $\frac{7}{6} = \frac{5}{x}$

8) $\frac{6}{5} = \frac{2}{5n}$

**Solve each proportion. Round your answers to the nearest hundredth.**

9) $\frac{7.7}{3.6} = \frac{2.3}{b}$

10) $\frac{v}{4.9} = \frac{5.4}{6.1}$

11) $\frac{6.3}{x} = \frac{2.56}{9.3}$

12) $\frac{3.4}{x} = \frac{2.17}{7.7}$

**Solve each proportion. Leave your answer as a fraction in simplest form.**

13) $\frac{9}{8} = \frac{k+6}{6}$

14) $\frac{2}{10} = \frac{4}{a-3}$

15) $\frac{10}{p+2} = \frac{4}{3}$

16) $\frac{4}{6} = \frac{8}{x-1}$

17) $\frac{m}{8} = \frac{m+7}{9}$

18) $\frac{n}{n+1} = \frac{3}{5}$

19) $\frac{9}{4} = \frac{r-10}{r}$

20) $\frac{x+6}{x} = \frac{10}{7}$

21) $\frac{n-9}{n+5} = \frac{7}{4}$

22) $\frac{6}{b+9} = \frac{4}{b+5}$

23) $\frac{8}{3} = \frac{v-9}{7v+4}$

24) $\frac{8}{5x-4} = \frac{6}{x+5}$

**Critical thinking questions:**

25) Do you think that a person's age and the amount they eat each day are basically in proportion?

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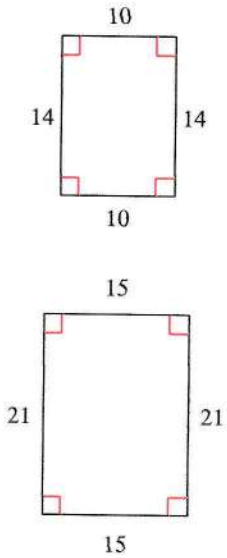
Name_____

# Similar Polygons

Date_____ Period____

**State if the polygons are similar.**

1)

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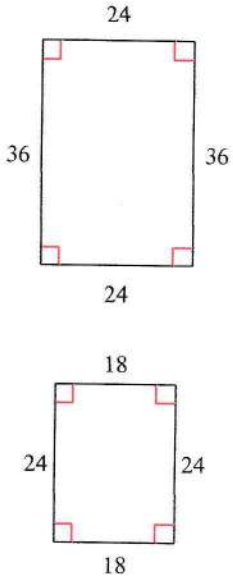


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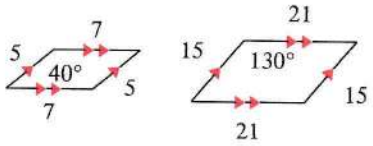


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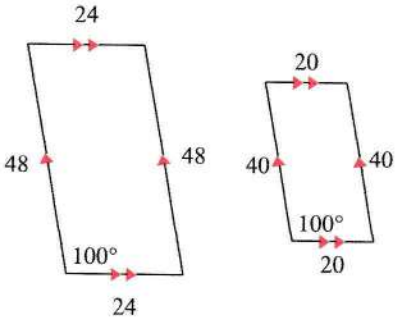


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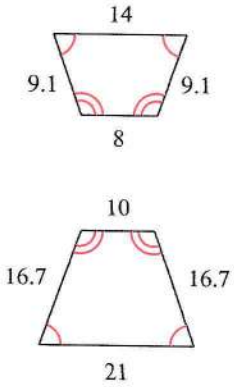


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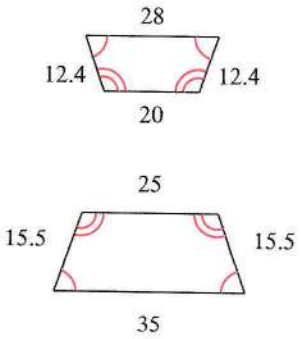


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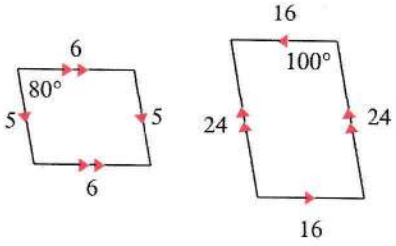


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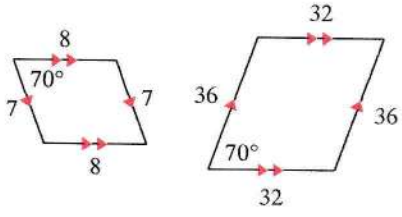

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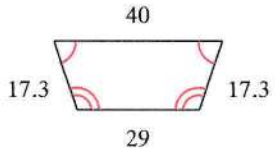


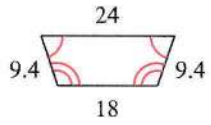


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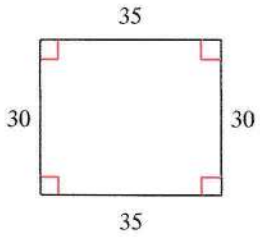
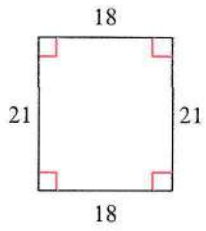
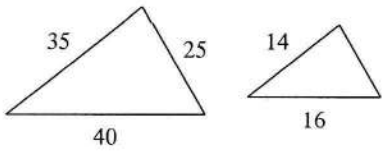



**The polygons in each pair are similar. Find the scale factor of the smaller figure to the larger figure.**

11)

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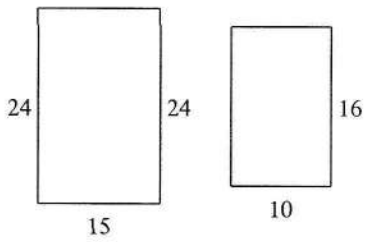


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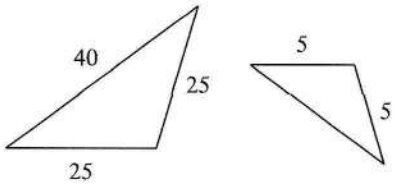


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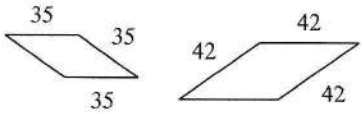


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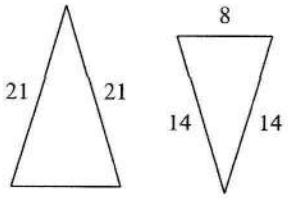


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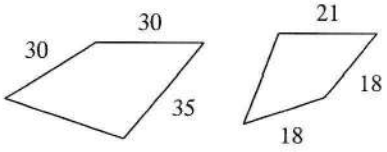


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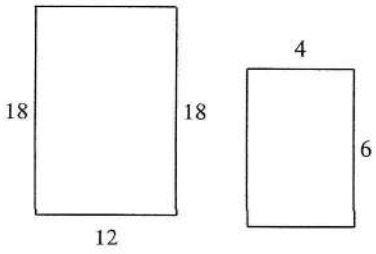


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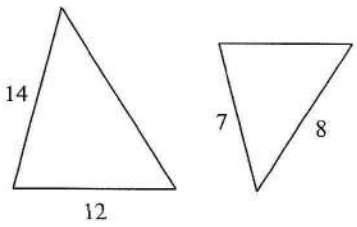

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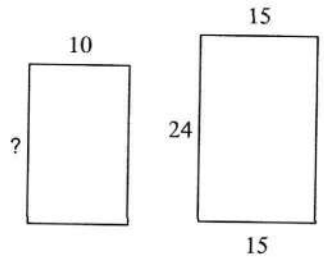
Name_____

# Using Similar Polygons

Date_____ Period____

**The polygons in each pair are similar. Find the missing side length.**

1)

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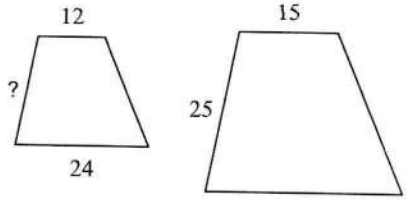


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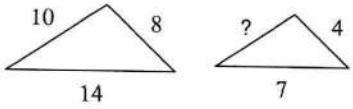


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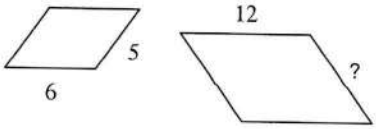


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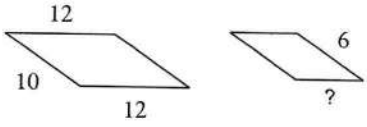


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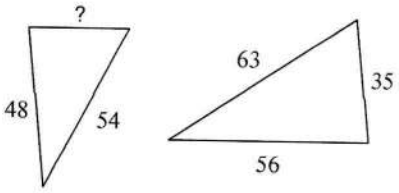


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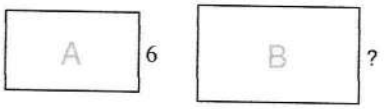
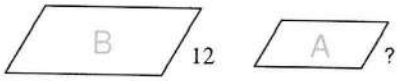


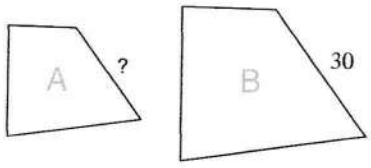

scale factor from A to B = 2 : 7

8)




scale factor from A to B = 2 : 3

9)




scale factor from A to B = 5 : 6

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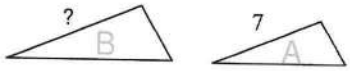
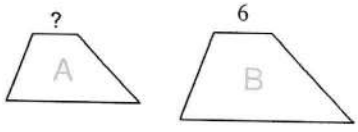



scale factor from A to B = 1 : 7

11)

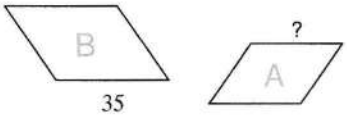

scale factor from A to B = 2 : 3

12)



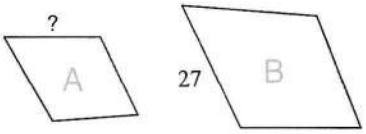

scale factor from A to B = 1 : 2

13)




scale factor from A to B = 6 : 7

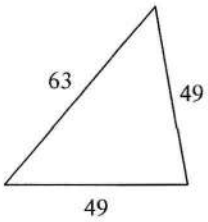
14)

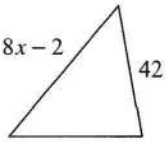



scale factor from A to B = 1 : 3

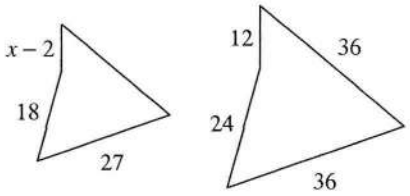
**Solve for $x$. The polygons in each pair are similar.**

15)

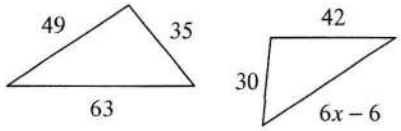


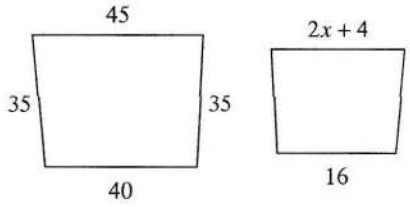

16)




17)



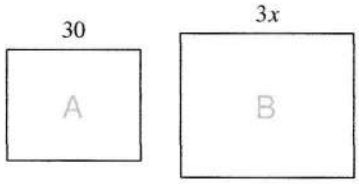

18)




19)

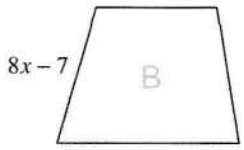

scale factor from A to B = 5 : 6

20)




scale factor from A to B = 5 : 6

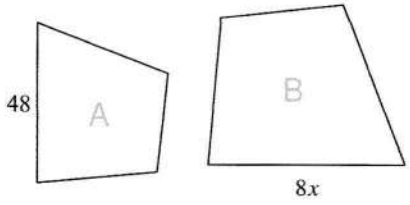
21)





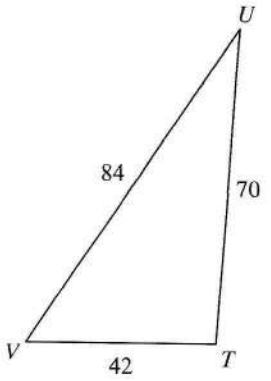
scale factor from A to B = 2 : 7

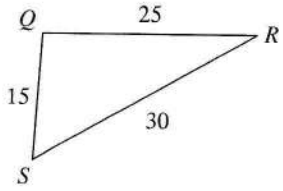
22)




scale factor from A to B = 6 : 7

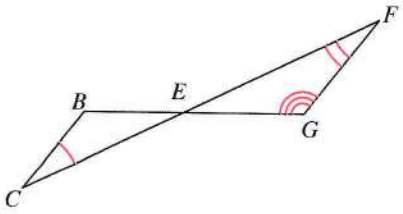
7)



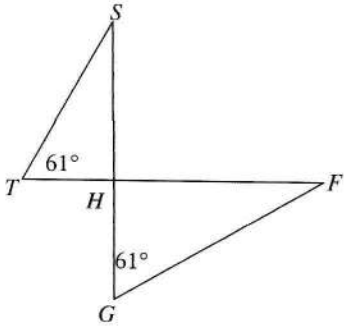

$\Delta TUV \sim$ _____

8)



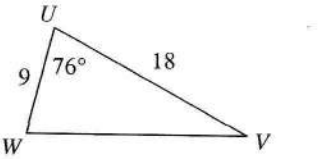

$\Delta EFG \sim$ _____

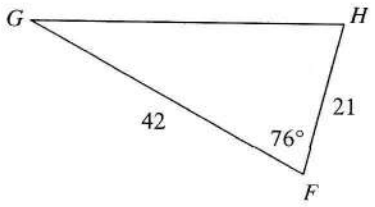
9)




$\Delta HGF \sim$ _____

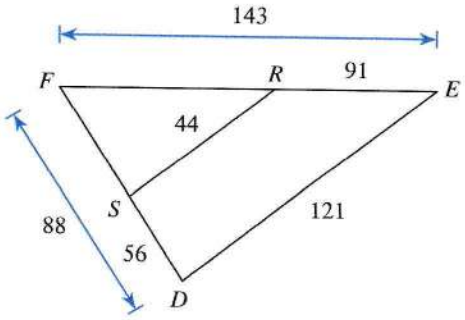
10)



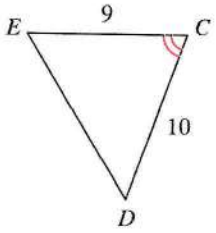

$\Delta FGH \sim$ _____

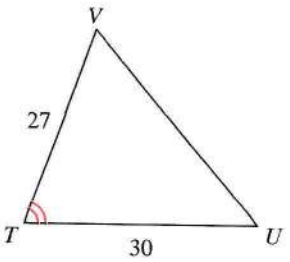
11)




$\Delta FED \sim$ _____

12)

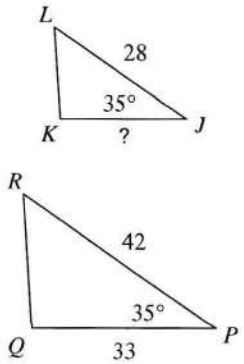


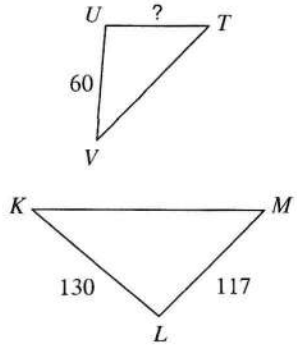

$\Delta TUV \sim$ _____

**Find the missing length. The triangles in each pair are similar.**

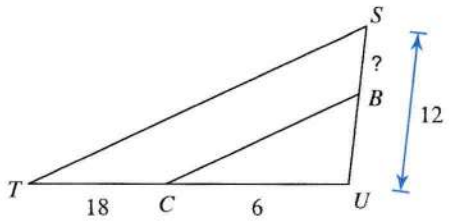
13)



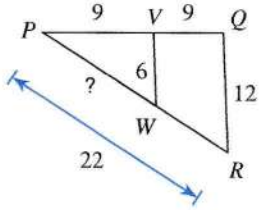

14)




15)

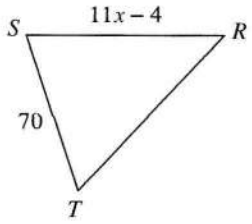


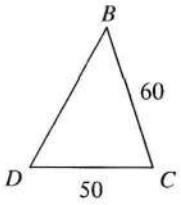

16)



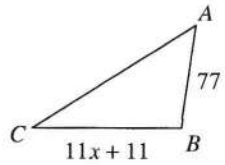

**Solve for $x$. The triangles in each pair are similar.**

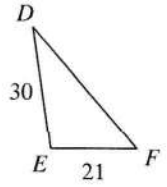
17)



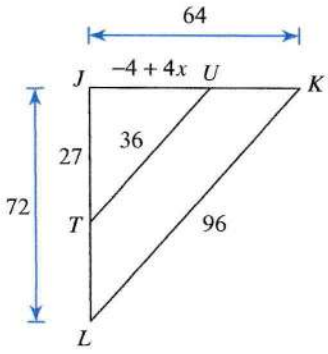




18)

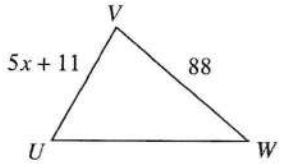


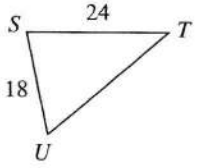




19)




20)



Kuta Software - Infinite Geometry

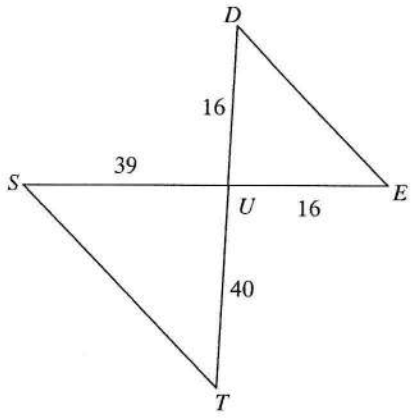
Name_____

# Similar Triangles

Date_____ Period____

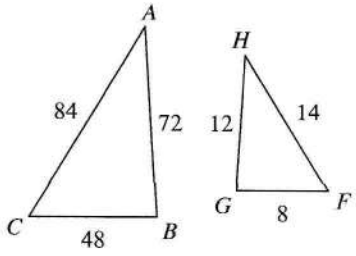
**State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.**

1)



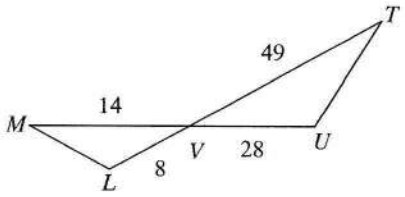

$\Delta UTS \sim$ _____

2)



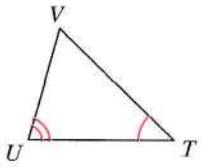

$\Delta CBA \sim$ _____

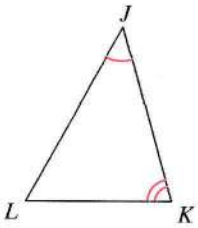
3)




$\Delta VUT \sim$ _____

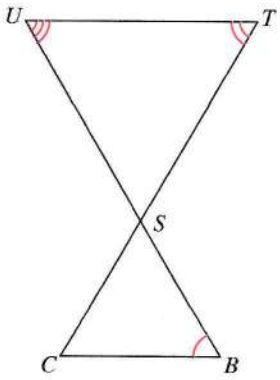
4)



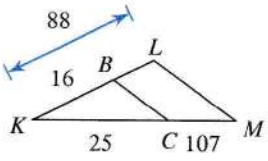

$\Delta JKL \sim$ _____

5)



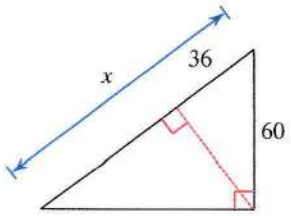

$\Delta STU \sim$ _____

6)

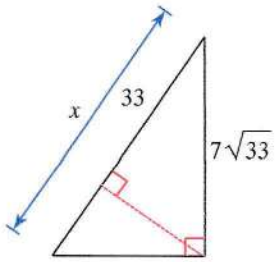



$\Delta KLM \sim$ _____

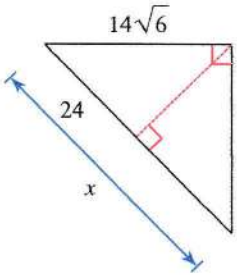
9)



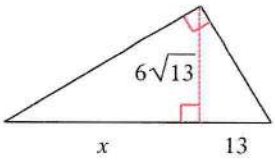

10)



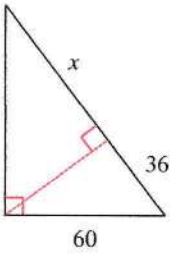

11)



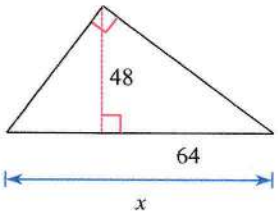

12)



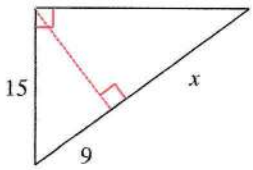

13)



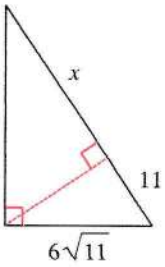

14)



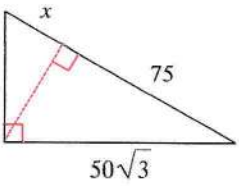

15)



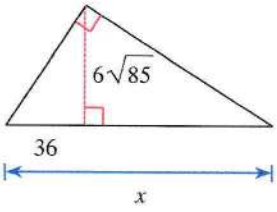

16)




17)




18)



Kuta Software - Infinite Geometry

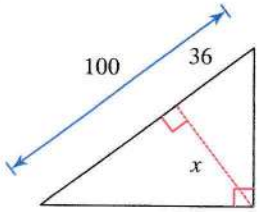
Name_____

# Similar Right Triangles

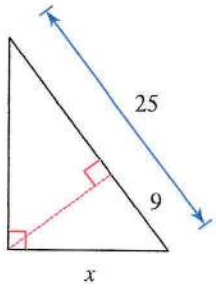
Date_____ Period____

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

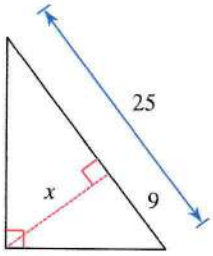
1)



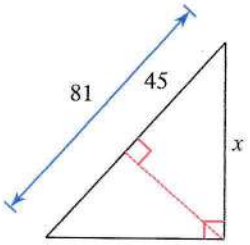

2)



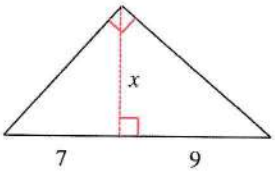

3)



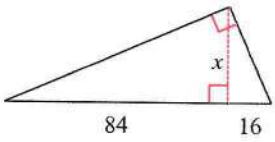

4)



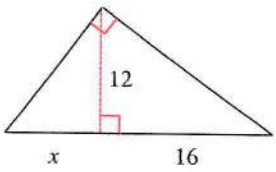

5)



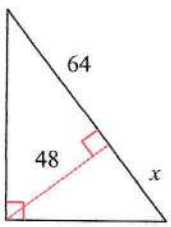

6)




7)




8)



Kuta Software - Infinite Geometry

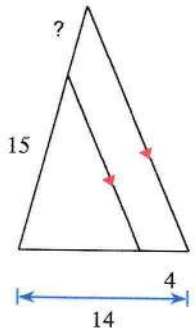
Name_____

# Proportional Parts in Triangles and Parallel Lines

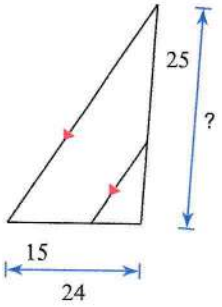
Date_____ Period____

**Find the missing length indicated.**

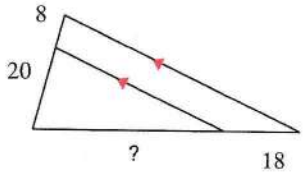
1)



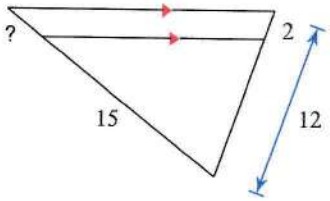

2)




3)

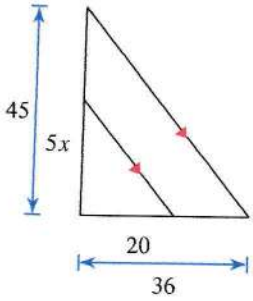



4)

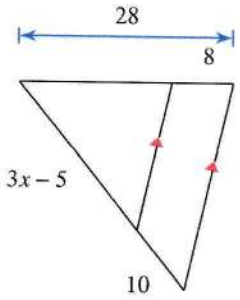



**Solve for $x$.**

5)

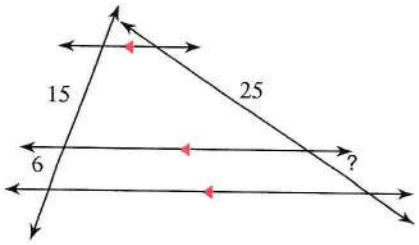



6)




**Find the missing length indicated.**

7)

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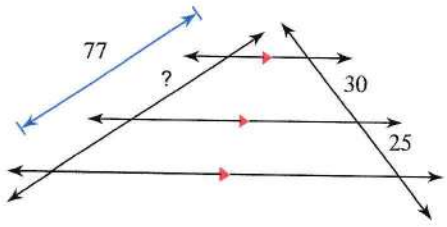

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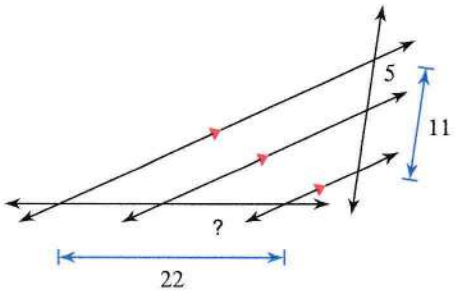


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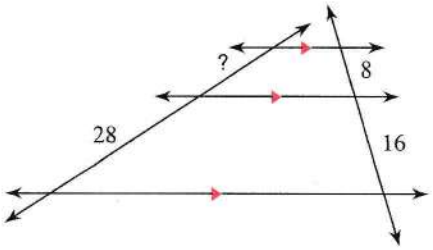
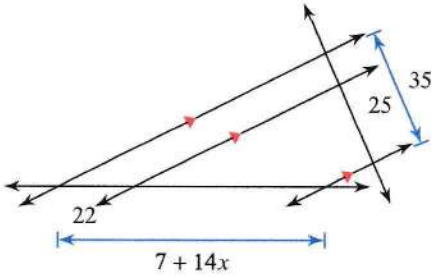



**Solve for $x$.**

11)

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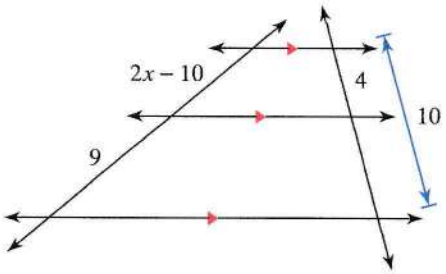
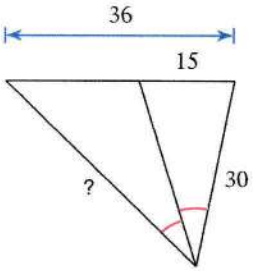
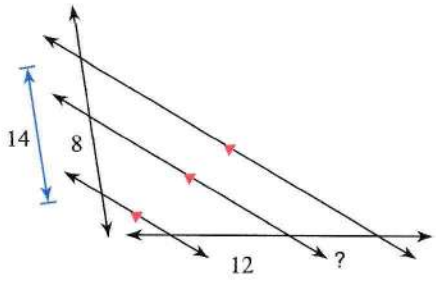



**Find the missing length indicated.**

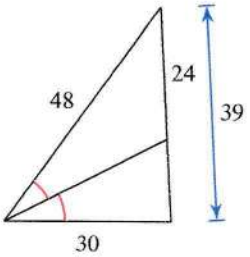
13)



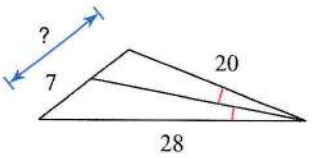

14)




15)

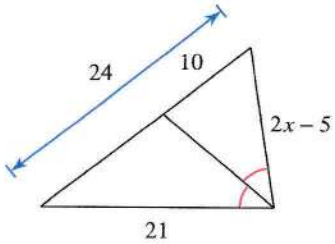



16)




**Solve for $x$.**

17)




18)