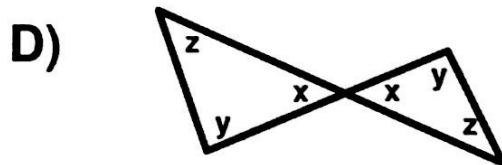
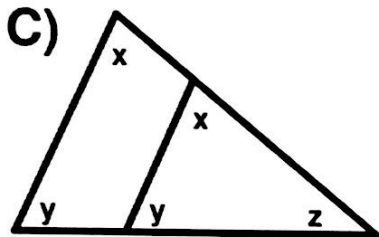
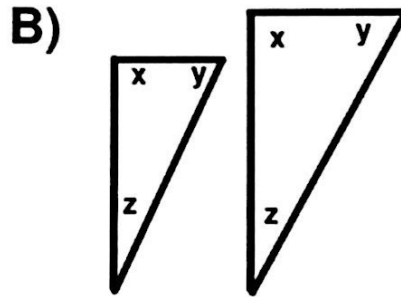
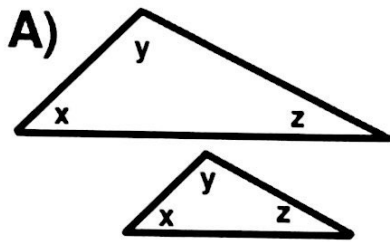


Similar Triangles

Similar triangles are triangles that have the same angle measurements, but they are different sizes. For example:

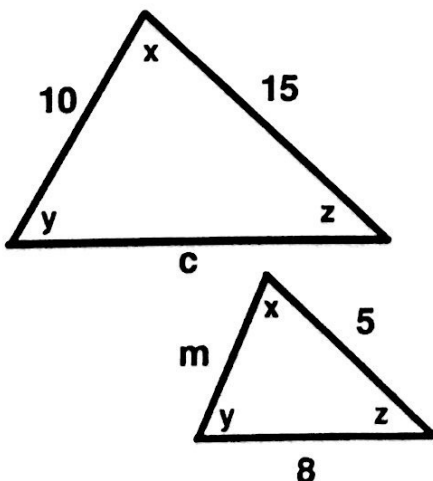


Each pair of triangles have the same angle measurement: either x or y or z . But, the lengths of the sides are different between the LARGE triangle and the small triangle.

This is why they are called *SIMILAR TRIANGLES*. They look very much like each other except that one is larger.

Finding the Length of Unknown Sides in Similar Triangles

Since this is math, we do not want to just "look" at these similar triangles, we want to do some math with them. Look at the pair below.



The larger triangle has two sides of which we know the length: 10 and 15 and one unknown side: c

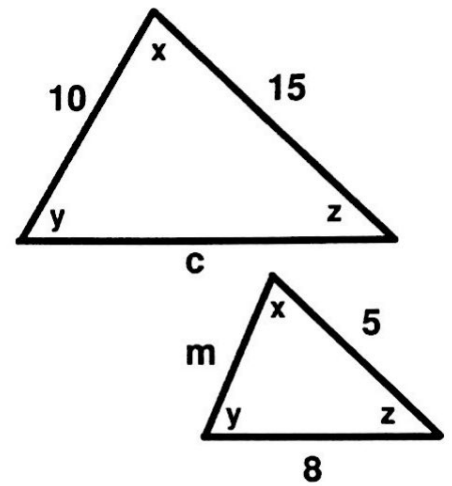
The smaller triangle has two sides of which we know the length: 5 and 8 and one unknown side: m .

Since the triangles are similar, then we can find out the lengths of the unknown sides by comparing sides and doing some math.

How To Find the Unknown Sides: Part 1

Find m:

Step 1: To find the unknown sides, we have to write an equation that looks like two fractions. In these two fractions, we have to include the lengths of three sides we know AND one unknown side: Use 10, m, 15, and 5.



Step 2: When we write the fractions, the numerators (top number) of each fraction will be the small triangle. The denominators (bottom number) will be the large triangle.

Step 3: When we write the fractions, we have to make sure that the numerator and denominator of each fraction are using the numbers or letters from the same similar side. It should look like this:

$$\begin{array}{l} \text{small triangle} \\ \text{large triangle} \end{array} \quad \frac{m}{10}, \frac{5}{15}$$

Step 4: Place an equal sign between the two fractions:

$$\frac{m}{10} = \frac{5}{15}$$

Step 5: Cross Multiplying: Remember: Multiply the numerator of one times the denominator of the other and then solve the equation:

$$\begin{aligned} m \times 15 &= 10 \times 5 \\ 15m &= 50 \\ m &= 50 \div 15 \\ m &= 3.33 \end{aligned}$$

Find c:

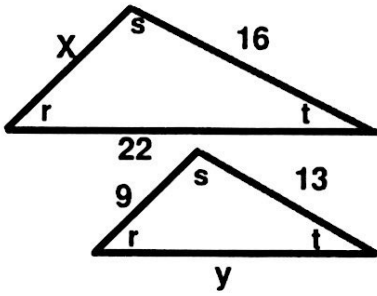
Step 1: small triangle $\frac{8}{c}$, $\frac{5}{15}$ (You can use the same numbers again)

Step 2: Equation: $\frac{8}{c} = \frac{5}{15}$

$$\begin{aligned} 8 \times 15 &= 5 \times c \\ 120 &= 5c \\ \text{or } 5c &= 120 \\ c &= 120 \div 5 \\ c &= 24 \end{aligned}$$

Now You Try: Look at each of the figures below. Use the similar triangles formula to find the perimeter of each. Show all of your work. You may want to use a separate piece of paper.

1)



Side X

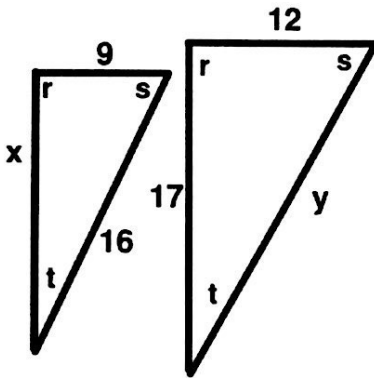
small triangle = $\frac{9}{13}$, $\frac{13}{16}$
 large triangle = x 16

Side Y

so $9 \times 16 = X \times 13$

or $144 = 13x$ now finish

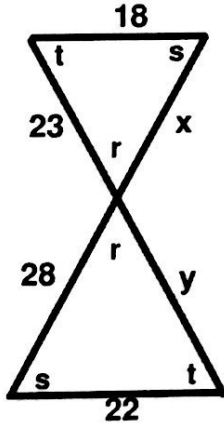
2)



Side X

Side Y

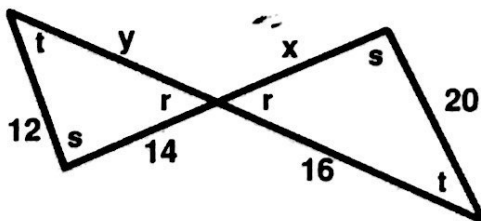
3)



Side X

Side Y

4)



Side X

Side Y

Worksheet 1: Similar Triangles

Score: _____ / 64 Percent: _____ % Name _____

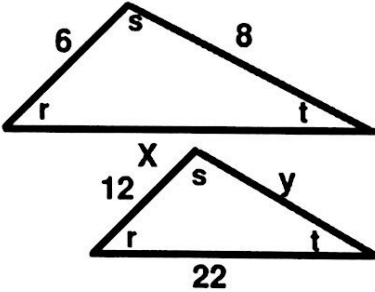
All Questions are worth 8 marks each. Date _____

Directions: Find the X and Y Sides. Show All Work. Use a separate pieces of paper if needed.

1)

Side X

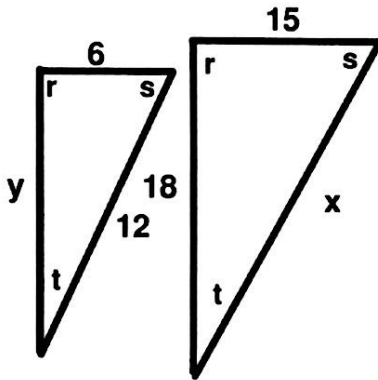
Side Y



2)

Side X

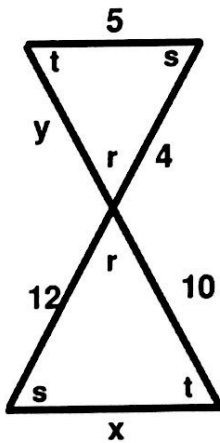
Side Y



3)

Side X

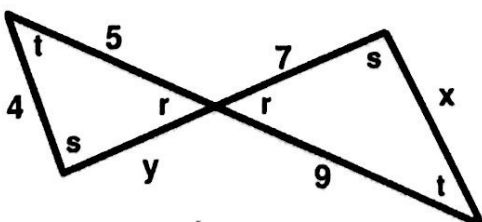
Side Y



4)

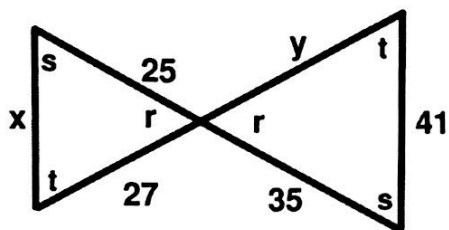
Side X

Side Y



Worksheet 1: Similar Triangles cont'd

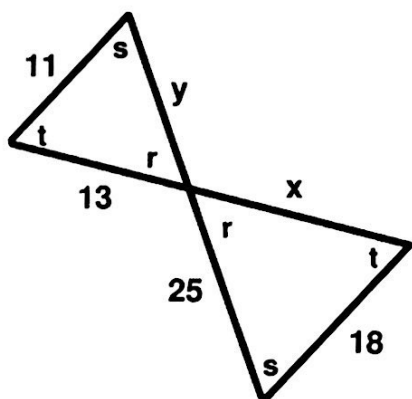
5)



Side X

Side Y

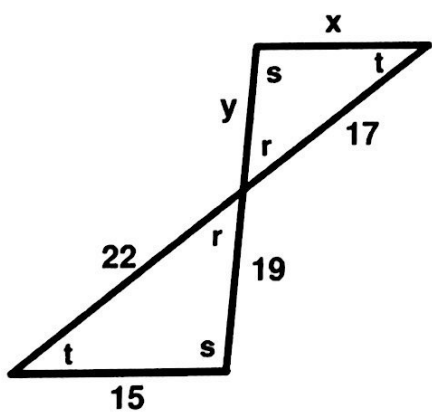
6)



Side X

Side Y

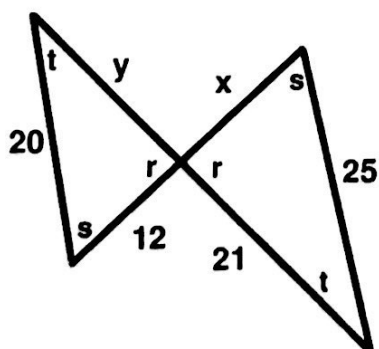
7)



Side X

Side Y

8)



Side X

Side Y