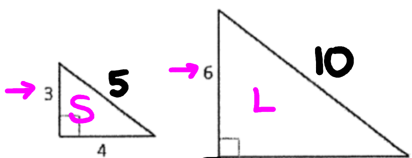
Math Name: ____________________

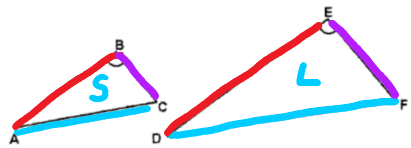
Similar Triangles

Triangles are **similar** if they have all the **SAME ANGLES** and the **RATIOS of their sides are the same**.

Here are some examples:



$\frac{S}{L}$ $\frac{3}{6} = \frac{4}{8} = \frac{5}{10}$

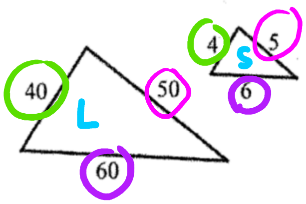


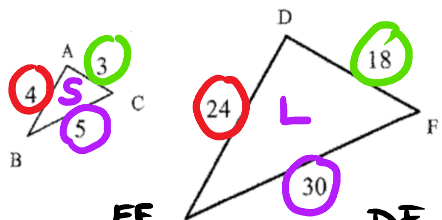
$\frac{L}{S} = \frac{DF}{AC} = \frac{FE}{CB} = \frac{DE}{AB}$

We can PROVE triangles are similar if we can show that the RATIOS of their CORRESPONDING SIDES are equivalent.

$\frac{L}{S} = \frac{40}{4} = \frac{60}{6} = \frac{50}{5}$ Yes.

$10 = 10 = 10$ ✓





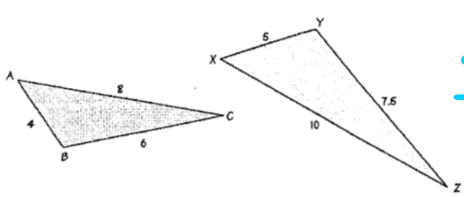
$\frac{EF}{BC} = \frac{DF}{CA} = \frac{DE}{AB}$

$\frac{S}{L} = \frac{4}{40} = \frac{6}{60} = \frac{5}{50}$ Yes.

$0.1 = 0.1 = 0.1$ ✓

$\frac{L}{S} = \frac{30}{5} = \frac{18}{3} = \frac{24}{4}$

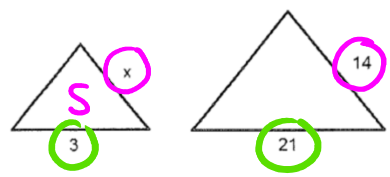
$6 = 6 = 6$ Yes. Similar



$\frac{S}{L} = \frac{5}{30} = \frac{3}{18} = \frac{4}{24}$

$0.1\overline{6} = 0.1\overline{6} = 0.1\overline{6}$ yes

If we KNOW that two triangles are similar, we can use their RATIOS and set up a PROPORTION to solve for unknown lengths.



$\frac{S}{L}$ $\boxed{\frac{x}{14} = \frac{3}{21}}$

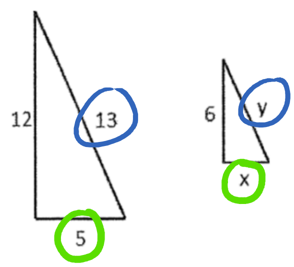
★When you have fractions across an equal sign★

cross multiply (across = sign and level)

then divide (use other #)

$14 \times 3 = 42$
$\div 21$

$x = 2$



$\frac{x}{5} = \frac{6}{12}$

$5 \times 6 = 30 \div 12 = x = 2.5$

$\frac{y}{13} = \frac{6}{12}$

$13 \times 6 = 78 \div 12$

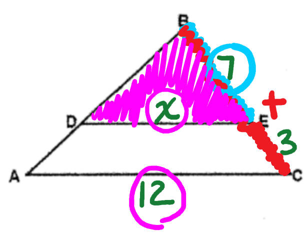
$y = 6.5$

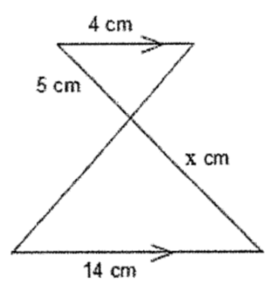
Sometimes similar triangles can be inside the same BIG triangle. These can be tricky to spot....

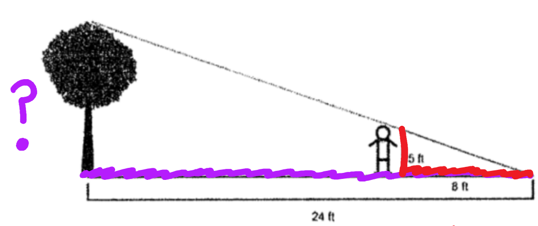
$\frac{S}{L} = \frac{x}{12} = \frac{7}{10}$

$12 \times 7 = 84 \div 10$

$\boxed{x = 8.4}$







$\frac{T}{B}$ $\frac{?}{5} = \frac{24}{8}$

$5 \times 24 = 120$
$\div 8$

$\boxed{\text{Tree} = 15\text{ft}}$