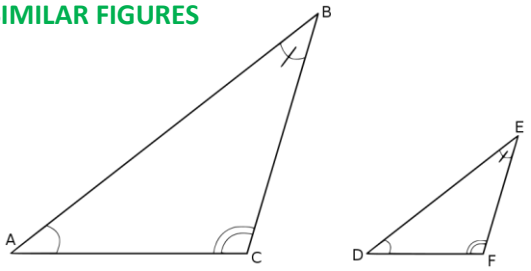
Name: _____ Date: _____ Sections 5-3A

5-3A Similar Figures

Similar Figures – same shape but different size. ~ "is similar to"
Congruent Figures – same shape and same size. ≅ "is congruent to"
Indirect Measurement – uses similar figures to find the length, width or height of objects that are too difficult to measure directly (use shadows and right triangles).

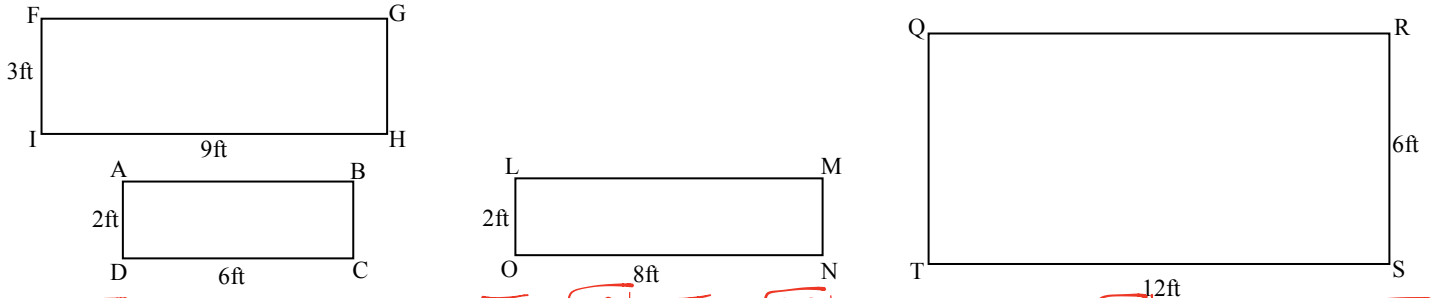
SIMILAR FIGURES



*Corresponding angles are congruent. They have the same relative position and equal measures.
CORRESPONDING ANGLES: $\angle A \cong \angle D, \angle B \cong \angle E, \angle C \cong \angle F$
*Corresponding sides are proportional. They are the same position with different lengths.
CORRESPONDING SIDES: $\overline{AC}$ and $\overline{DF}$, $\overline{AB}$ and $\overline{DE}$, $\overline{BC}$ and $\overline{EF}$

NOTE: Are scale drawings and models considered similar figures? Yes → same shape, but different size (proportional)

Ex. 1: Identify which rectangle is similar to rectangle FGHI. (same shape, proportional corresponding sides)

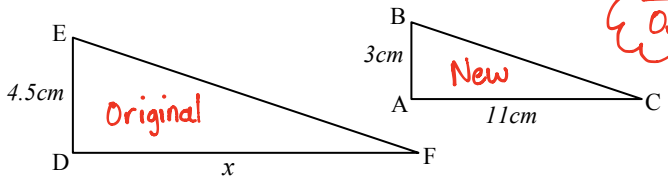


$\frac{FI}{AD} = \frac{3ft}{2ft}$ $\frac{HI}{CO} = \frac{9ft}{6ft} = \frac{3ft}{2ft}$ $\frac{FI}{LO} = \frac{3ft}{2ft}$ $\frac{HI}{NO} = \frac{9ft}{8ft}$ $\frac{FI}{RS} = \frac{3ft}{6ft} = \frac{1ft}{2ft}$ $\frac{HI}{ST} = \frac{9ft}{12ft} = \frac{3ft}{4ft}$

$\square FGHI \sim \square ABCD$ "rectangle FGHI is similar to rectangle ABCD"

Ex. 2: If $\triangle ABC \sim \triangle DEF$, find the length of $\overline{DF}$.

New / Original



$\frac{AC}{DF}$ $\frac{\text{base}}{\text{base}}$ $\frac{11}{x} = \frac{3}{4.5}$ $\frac{AB}{DE}$ $\frac{\text{height}}{\text{height}}$

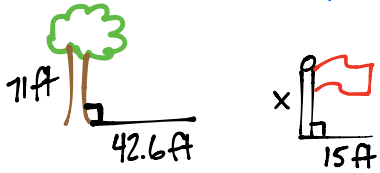
$\frac{11}{x} = \frac{3}{4.5}$

$\frac{49.5}{3} = \frac{3x}{3}$

$x = 16.5\ cm$

Ex. 3: At a certain time of day, a palm tree that is *71ft* high casts a shadow *42.6ft* long. At the same time, a nearby flagpole casts a shadow that is *15ft* long. How tall is the flagpole?

*Hint: Draw a picture (right angles between object and its shadow)



New / Original $\frac{\text{height}}{\text{height}}$ $\frac{\text{shadow}}{\text{shadow}}$ $\frac{x}{71} = \frac{15}{42.6}$

$\frac{42.6x}{42.6} = \frac{1065}{42.6}$

$x = 25\ ft$

HW: GM7 p. 296 (1-12, omit 11)