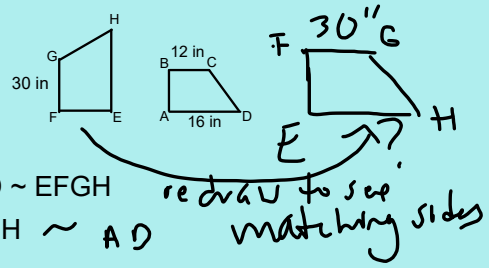
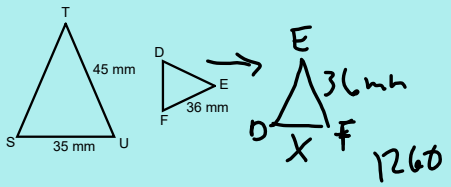
Section 6.5
Similarity and Measurement

Goal: to find the unknown side lengths of similar figures.



ABCD ~ EFGH
Find EH ~ AD
redraw to see matching sides

$\frac{12}{16} = \frac{30}{x}$ $12x = 30(16)$ $\frac{12x}{12} = \frac{480}{12}$ $x = 40$"



STU ~ DEF
Find DF

$\frac{45}{36} = \frac{35}{x}$ $45x = 1260$ $\frac{45x}{45} = \frac{1260}{45}$ $x = 28$mm

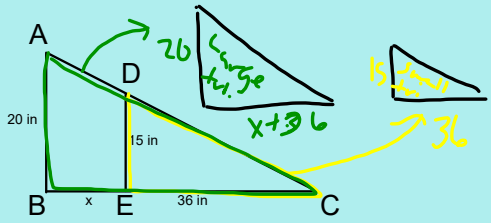
Indirect Measurement: using similar figures to find lengths that are difficult to measure directly.

Ex: The shadow cast by a 4-foot tall female ostrich is 10 feet long. A male ostrich standing nearby casts a shadow that is 15 feet long. How tall is the male ostrich?

$\frac{\text{height}}{\text{shadow}} = \frac{\text{height}}{\text{shadow}}$ $\frac{4}{10} = \frac{x}{15}$ $10x = 60$ $x = 6$

A cactus is 5 feet tall and casts a shadow that is 1.5 feet long. How tall is a nearby cactus that casts a shadow that is 8 feet long?

$\frac{h}{5} = \frac{h}{5}$ $\frac{5}{1.5} = \frac{x}{8}$ $\frac{40}{1.5} = \frac{1.5x}{1.5}$ $x = 26\frac{2}{3}$'



Set up a proportion to find x.

$\frac{20}{x+36} = \frac{15}{36}$ $20(36) = 15(x+36)$ $720 = 15x + 540$ $-540 \quad -540$ $\frac{180}{15} = \frac{15x}{15}$ $x = 12$

Hwk: pg. 307 - 309
#5, 6, 8 - 12 all, 15,
20, 24, 25