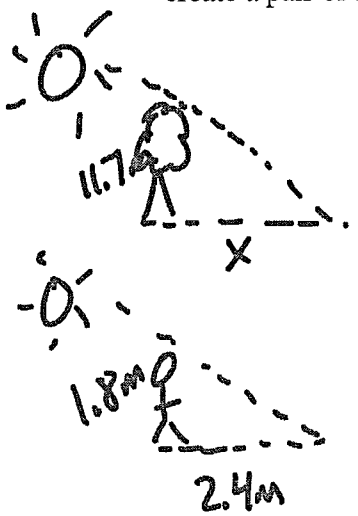
Math 9 3.5—notes

Goal: Use properties of similar triangles to solve problems

The sun creates shadows on the tree and the person below. The objects and shadows create a pair of SIMILAR TRIANGLES. Find the length of the shadow of the tree.



Method 1

- Find scale factor of tree

$11.7m \div 1.8 = 6.5$ (our S.F.)

$X = SF \times 2.4$

$X = 6.5 \times 2.4$

$x = 15.6m$

Method 2

cross multiplication → compare ratios to solve for X

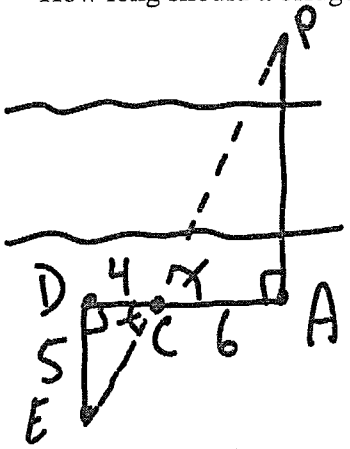
$$\frac{11.7}{1.8} = \frac{x}{2.4}$$

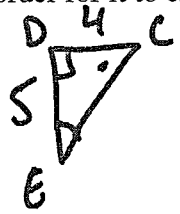
$1.8x = 11.7 \times 2.4$

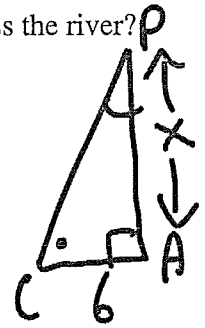
$$\frac{1.8x}{1.8} = \frac{28.08}{1.8}$$

$x = 15.6m$

How long should a bridge be in order for it to cross the river?







$PA : ED$

$DC : CA$

$PC : EC$

Method #1

- scale factor

$6 \div 4 = 1.5$

$X = SF \times 5 \rightarrow SF = \frac{X}{5}$

$x = 1.5 \times 5$ or solve for x

$= 7.5m$ $x = (SF)(5)$

Method #2

$$\frac{6}{4} = \frac{x}{5}$$

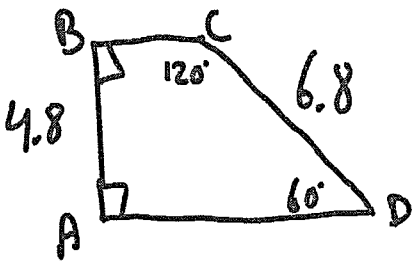
$4x = (6)(5)$

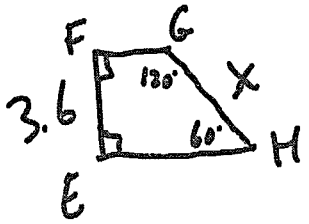
$4x = 30$

$$\frac{4x}{4} = \frac{30}{4}$$

$x = 7.5m$

Find the length of GH in the diagram below





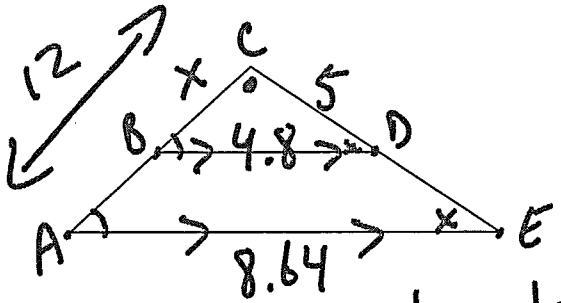
1) Are these shapes similar?
yes, b/c there are 4 pairs of equal corresponding angles
$\angle A = \angle E$; $\angle B = \angle F$, $\angle C = \angle G$
$\angle D = \angle H$

2) Find GH
→ find scale factor of EFGH
~~$4.8 \div 3.6 = 1.3$~~ this is >1, but image not enlargement

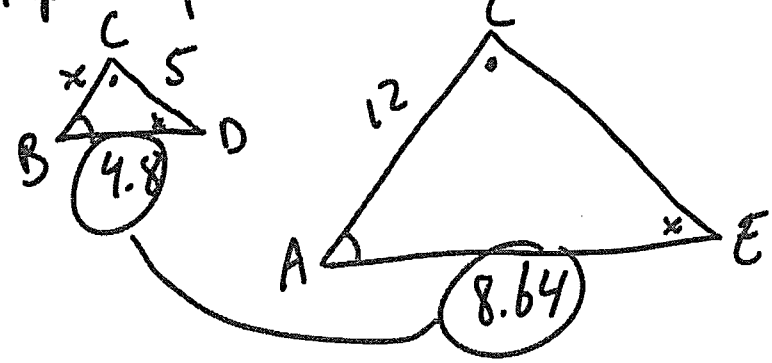
$3.6 \div 4.8 = 0.75$

3) solve for x
x = corresponding side × SF
= 6.8 × 0.75
= 5.1

Find the length of BC



step 1 - separate the triangles



step 2 → Scale Factor
→ looking for SF to be ∠1
$4.8 \div 8.64 = 0.56$

step 3 → solve for x
x = (corresponding side)(SF)
= (12)(0.56)
= 6.72

HW - pg 135 #3, 7-9, 11, 13 ~~a,c~~, 14, 16, 17a, 18, 19