

Similar Polygons

1. The measures of corresponding angles must be equal

AND

2. The ratios of the lengths of corresponding sides must be equal.

Similar Triangles

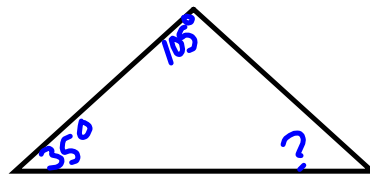
Triangles are a special polygon.

1. The measures of corresponding angles must be equal

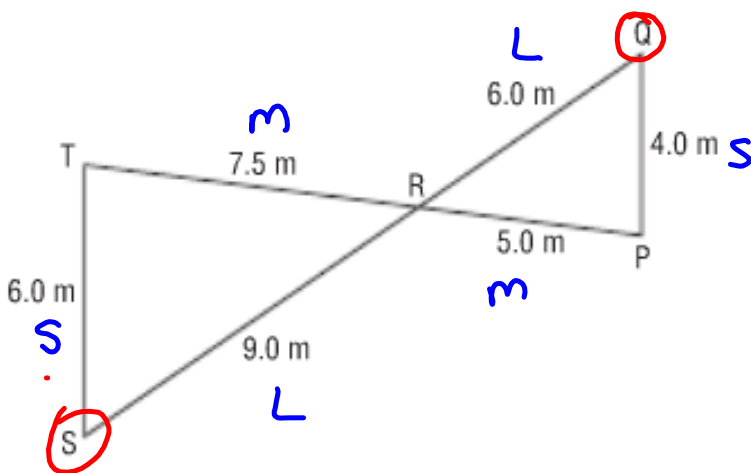
OR

2. The ratios of the lengths of corresponding sides must be equal

sum of the angles of a triangle is 180°



$$105^\circ + 35^\circ + \underline{40} = 180$$



Ratio of sides
short = medium = long

$$\frac{ST}{QP} = \frac{RT}{RP} = \frac{RS}{RQ}$$

$$\frac{6}{4} = \frac{7.5}{5} = \frac{9}{6}$$

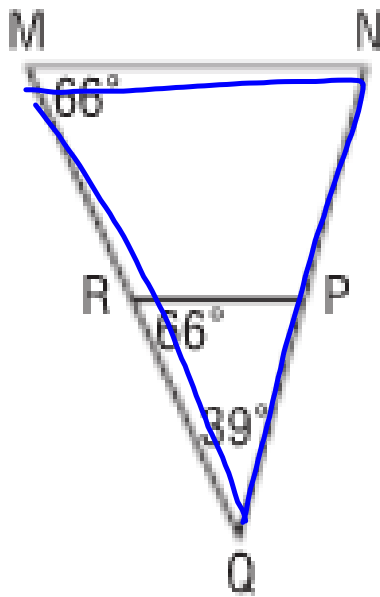
1.5

1. In triangle SRT list the sides shortest to longest

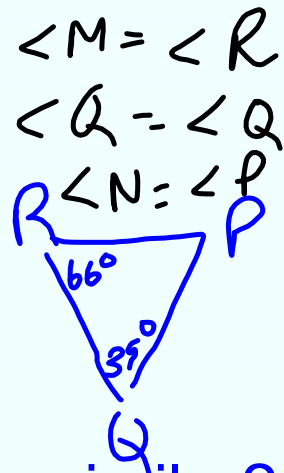
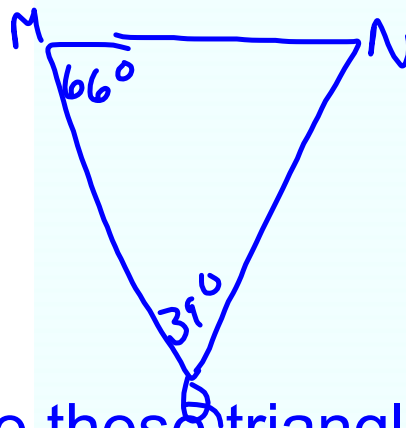
ST, RT, SR
TS, TR, RS

2. In triangle RQP list the sides shortest to longest

QP, PR, QR
PQ, RP, RQ



Draw the two triangles separately!



$\angle M = \angle R$
 $\angle Q = \angle Q$
 $\angle N = \angle P$

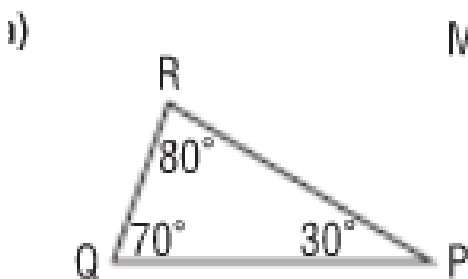
Are these triangles similar?

yes $\triangle QNM \sim \triangle QPR$

Find the missing angle? 75°



Are these triangles similar? show proof.



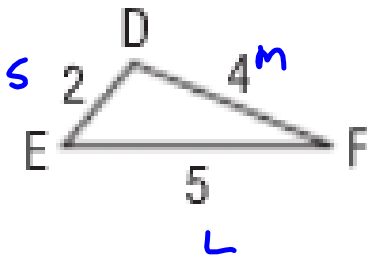
$$\begin{aligned} \angle M &= \angle Q \\ \angle H &= \angle R \\ \angle N &= \angle P \end{aligned}$$

Ratio of corresponding sides:

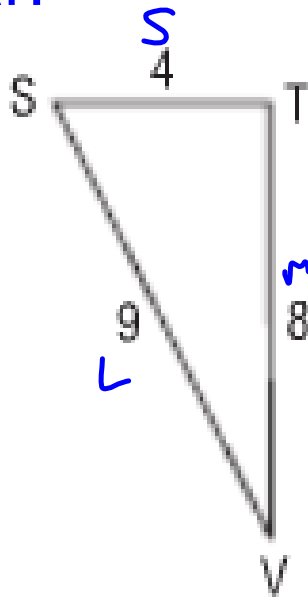
$$\frac{RP}{HN} = \frac{QP}{MN} = \frac{QR}{MH}$$

$$\triangle MHN \sim \triangle QRP$$

Are they similar:



1:2
 $\frac{1}{2}$



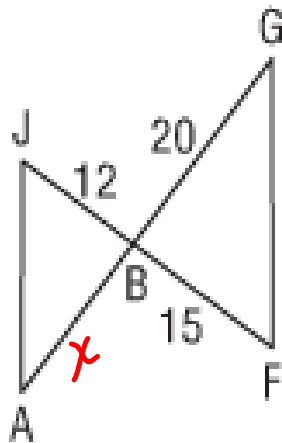
Short = medium = long

$$\frac{ED}{ST} = \frac{DF}{TV} = \frac{EF}{SV}$$

$$\frac{2}{4} = \frac{4}{8} = \frac{5}{9}$$

0.5 = 0.5 = 0.5
 NOT similar

Find the unknown side [AB] given the two triangles are similar

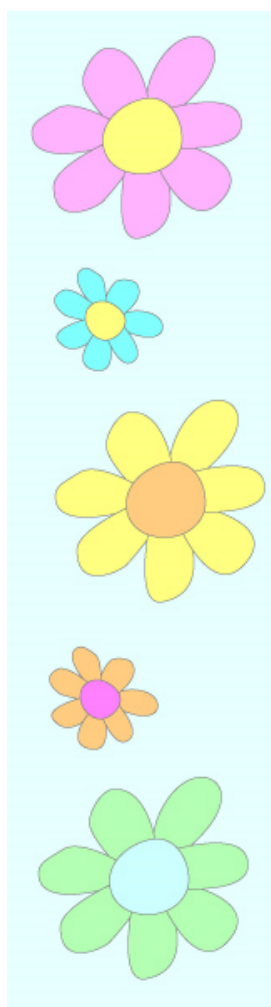


$$\frac{AB}{FB} = \frac{JB}{GB}$$

$$\cancel{(15)} \frac{AB}{15} = \frac{12}{20} \cancel{(15)}$$

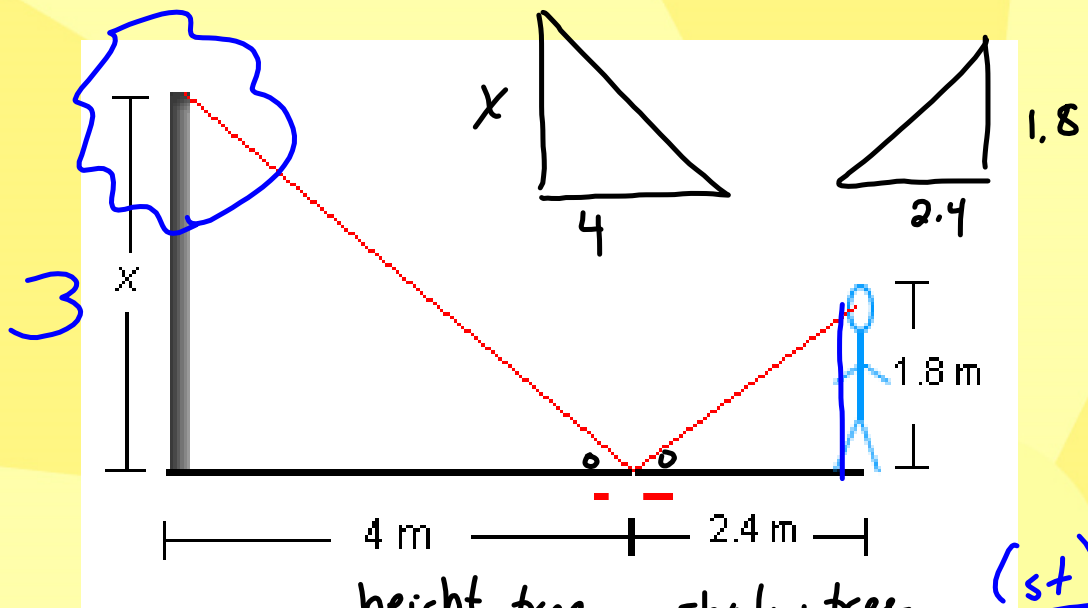
$$AB = \frac{180}{20}$$

$$AB = 9$$



Using Similar Triangles to Solve Problems...

Solve for x... Using shadows to find heights



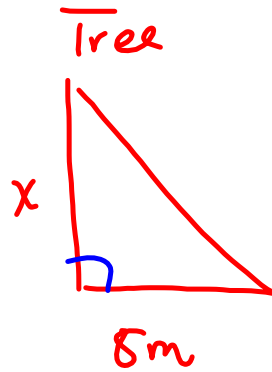
$$\frac{\text{height tree}}{\text{height person}} = \frac{\text{shadow tree}}{\text{shadow person}} \quad \left(\frac{st}{sp}\right)$$

$$\frac{x}{1.8} = \frac{4}{2.4}$$

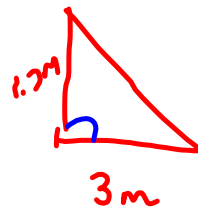
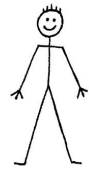
$$x = \frac{7.2}{2.4}$$

$$x = 3$$

George is 1.7 m tall. His shadow is 3 m long. He is standing beside a tree that has a shadow that is 8 m long. How tall is the tree?



George

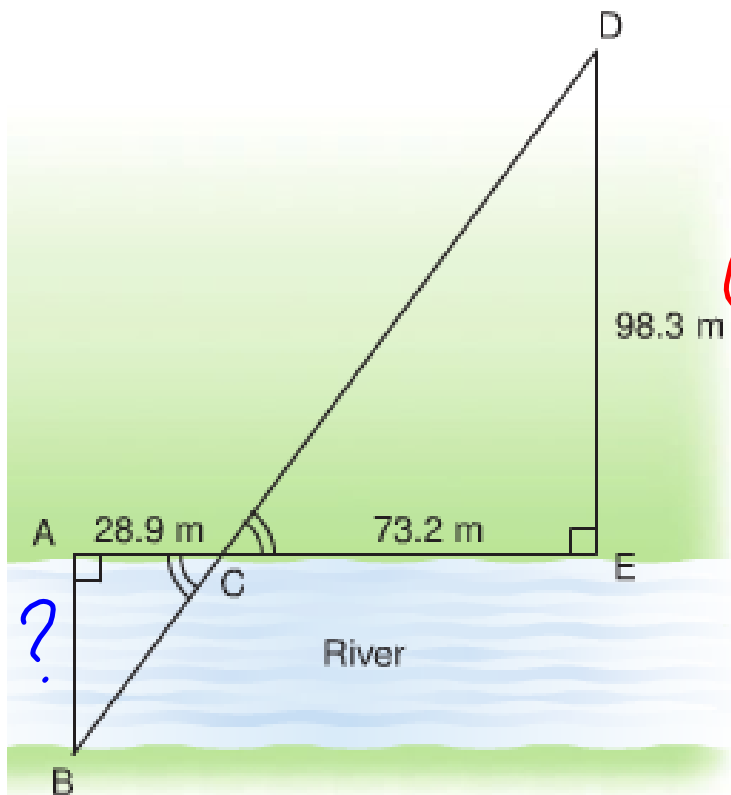


$$\frac{h \cdot t}{h \cdot p} = \frac{s \cdot t}{s \cdot p}$$

$$\frac{x}{1.7} = \frac{8}{3}$$

$$x = \frac{13.6}{3}$$

$$x = 4.53m$$

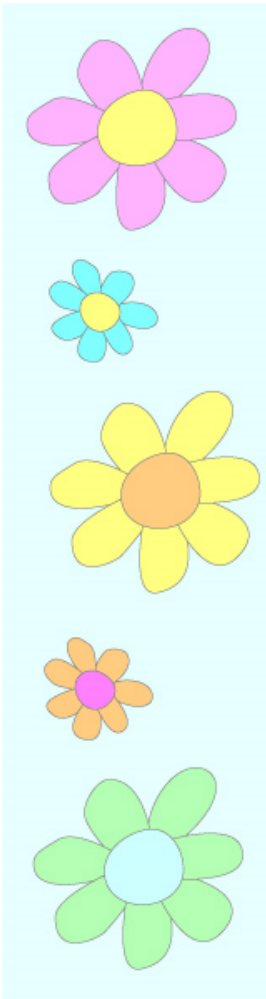


Find the distance across the river

$$\frac{AB}{\cancel{98.3}} = \frac{28.9}{73.2} \quad (\cancel{98.3})$$

$$AB = \frac{2840.87}{73.2}$$

$$AB = 38.8 \text{ m}$$



Homework

Page 349

4 [b,c] show work

5 [a, b]

6 [a, ~~c~~]

7 sketch

9 sketch

10 sketch

Sketch
all
triangles!
Answers pg
524-525

Short Quiz on sections

7.1-7.4 **Wednesday**