Before we begin, are there any questions from last day's work?

Read pp.331-332 Ex. 1, Ex. 2, and Key Concepts

pp. 333-334 #5bc, 6bc, 7b, 8b, 9b, 14, 15

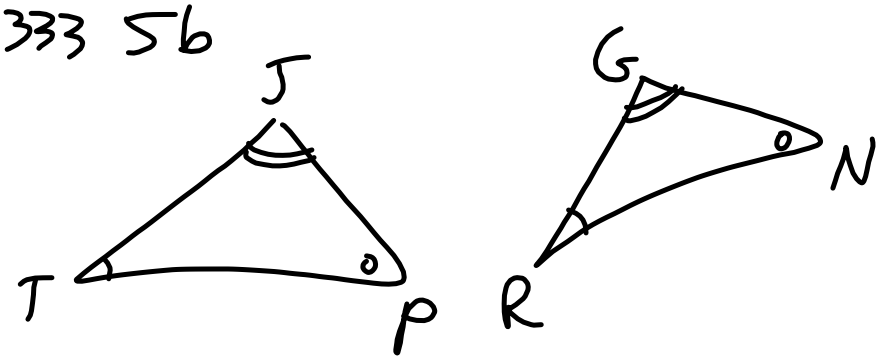
a ruler is needed >>> p. 347 #1, 2

Today's Learning Goal(s):

By the end of the class, I will be able to:

a) prove two triangles are similar.
b) solve problems using similar triangles.

p. 333 56



$\triangle JTP \sim \triangle GRN$

or

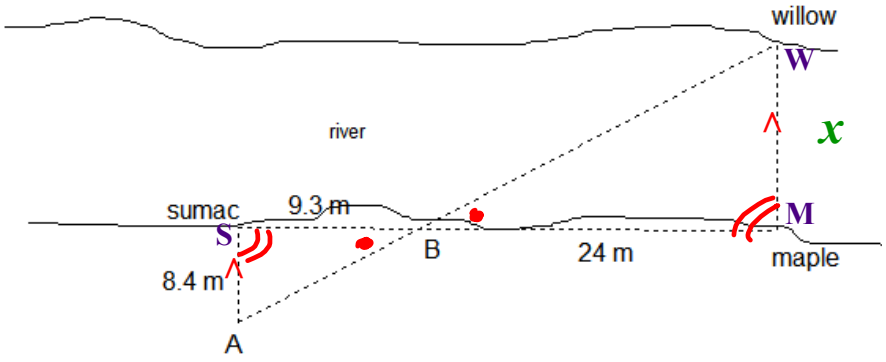
$\triangle PTJ \sim \triangle NRG$

MPM 2DI

7.2 Use Similar Triangles to Solve Problems

Date: Dec. 12/16

Ex. 1: To determine the width of a river, Naomi finds a willow tree and a maple tree that are directly across from each other on opposite shores. Using a sumac tree on the shoreline, Naomi plants two stakes, A and B, and measures the distances as shown.
Using a compass, she plants stake A so that it is parallel to the line segment made with the willow and maple tree. Find the width of the river (2 decimal places).



- If we first prove that the triangles are similar, then the ratio of their side lengths is proportional.
- To prove that the triangles are similar, we must show that 2 of the angles are equal.
- $\angle ASB = \angle WMB$ (Z pattern)
  $\angle SBA = \angle MBW$ (opposite)
- $\therefore \Delta ASB \sim \Delta WMB$
- $\therefore \frac{AS}{WM} = \frac{SB}{MB} = \frac{AB}{WB}$

We must always prove similarity first!

- Now, let x represent the width of the river, in m.

$\therefore \frac{8.4}{x} = \frac{9.3}{24}$

$9.3x = 8.4(24)$

$\frac{9.3x}{9.3} = \frac{201.6}{9.3}$

$x \doteq 21.677$

$x \doteq 21.68$ m

Or $\frac{x}{8.4} = \frac{24}{9.3}$

$x = 8.4\left(\frac{24}{9.3}\right)$

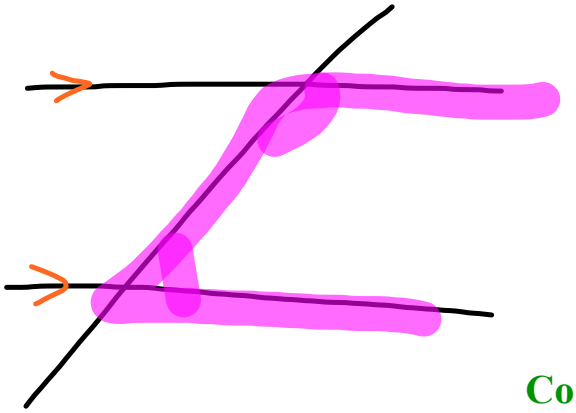
$\doteq 21.677$

$\doteq$

$x \doteq 21.677$

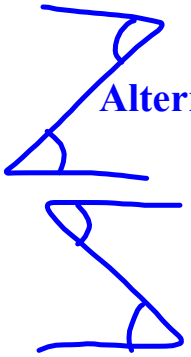
$\therefore$ the width of the river is 21.68 m.

Transversal-Parallel Line Angle Properties



Co-interior angles are *supplementary* (they ADD to 180°)

C Pattern



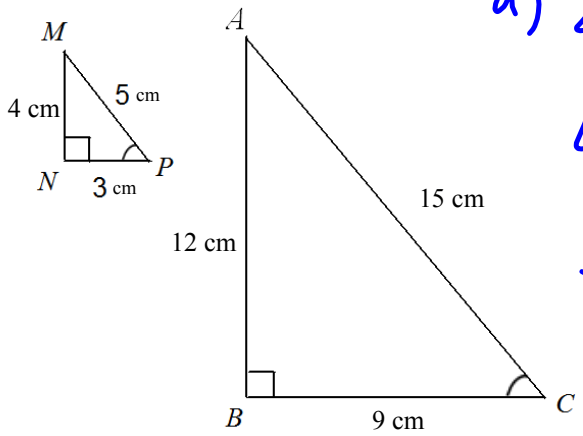
Alternate (interior) angles are EQUAL

Z Pattern

Corresponding angles are EQUAL

F Pattern

Ex. 2: Given two triangles:



a) $\angle MNP = \angle ABC$ (given)

$\angle MPN = \angle ACB$ (given)

$\therefore \Delta MNP \sim \Delta ABC$

a) Prove $\Delta MNP \sim \Delta ABC$

b) What is the relationship between the areas in each pair of similar figures?

c) Find the scale factor, k, for each pair of figures.

d) Compare your answers to parts b) and c).

$A_{\Delta MNP} = \frac{bh}{2}$

$= \frac{3(4)}{2}$

$= 6 \text{ cm}^2$

$A_{\Delta ABC} = \frac{bh}{2}$

$= \frac{9(12)}{2}$

$= 54 \text{ cm}^2$

$\frac{A_{\Delta ABC}}{A_{\Delta MNP}} = \frac{54}{6}$

$= \frac{9}{1}$

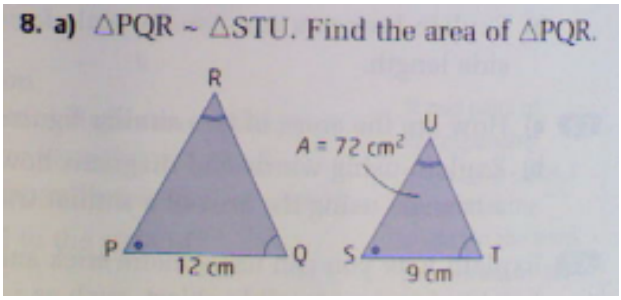
c) $k = \frac{AB}{MN}$

$= \frac{12}{4}$

$= 3$

d) $A_{\Delta ABC} = k^2 (A_{\Delta MNP})$

8. a) $\triangle PQR \sim \triangle STU$. Find the area of $\triangle PQR$.



$k = \frac{12}{9}$

$= \frac{4}{3}$

$$A_{\triangle PQR} = k^2 \left(A_{\triangle STU} \right)$$

$$= \left(\frac{4}{3} \right)^2 (72)$$

$$= \frac{16}{9}\left(\cancel{72}^{8}\right)$$

$$= 128 \text{ cm}^2$$

Be FULLY prepared for tomorrow's Unit 6 Summative.

Today's practice: **READ** p. 347 "Key Concepts"
pp. 348-350 #7, 8ab, 9, 11, 12, 16, 19