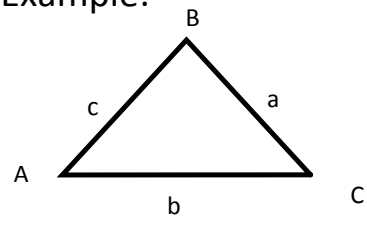
6.2 Similar Triangles and Indirect Measurement

Labelling Non-Right Triangles

- Angles are denoted by capital leers
- Sides are denoted by lowercase leers

Example:

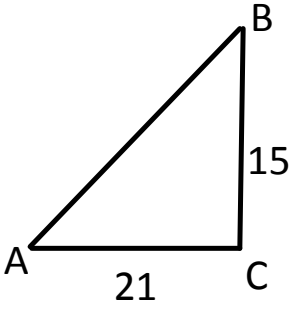


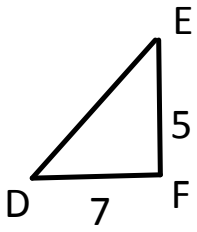
- side 'a' is opposite angle A
- the smallest angle is opposite the smallest side
- the largest angle is opposite the largest side
- the sum of the 2 smaller sides must be greater than the 3rd side

Scale Factor/Rao:

- the measure of the enlargement or reducon of one similar triangle to another.
- denoted by "k".

Consider these similar triangles and determine the scale factor.





The scale factor is _____ .

ΔABC is _____ ΔDEF.

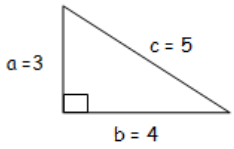
ΔDEF is _____ ΔABC.

Any side length in ΔABC = _____ the corresponding side length in ΔDEF.

Any side length in ΔDEF = _____ the corresponding side length of ΔABC.

How are the perimeter and area of similar triangles related?

ex. Given $\triangle ABC$, where a =3 units, b = 4 units and c = 5 units, determine the perimeter and area of $\triangle ABC$ and of triangles with scale factors of 2 and 3 compared to $\triangle ABC$.



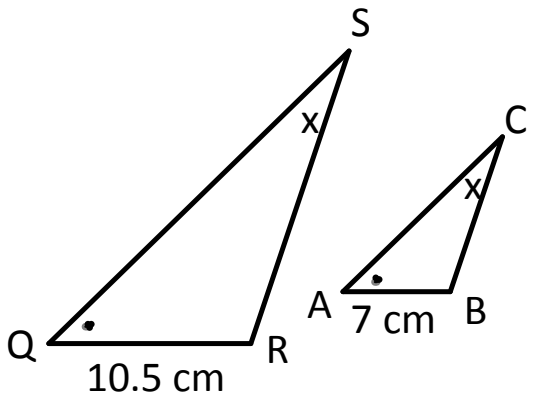
Scale Factor	Side lengths (a, b, c)	Perimeter (units)	Area (units^2)
$\triangle ABC$	3, 4, 5	12	6
2	6, 8, 10		
3	9, 12, 15		
n	3n, 4n, 5n		

General Results (where 'k' is the scale factor)

If Δ ABC ≈ Δ XYZ where $k = \frac{AB}{XY}$, then:

1. any side of Δ ABC = k (corresponding side in Δ XYZ)
2. perimeter of Δ ABC = k (perimeter of Δ XYZ)
3. area of Δ ABC = k^2 (area of Δ XYZ)

Ex. 2 a) Determine the scale factor.
b) If BC = 10 cm determine the length of RS.



c) If the area of ΔABC = 32 cm^2, determine the area of ΔQRS.

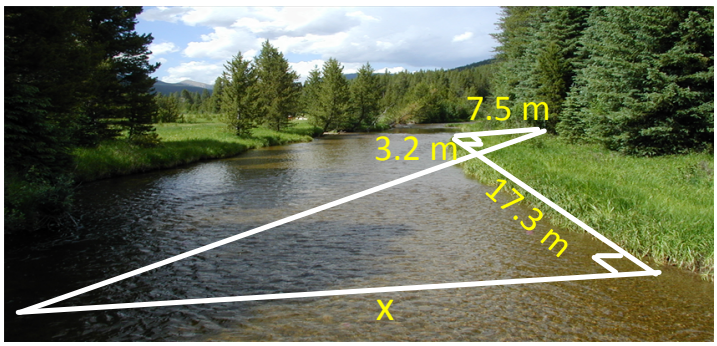
d) If the area of ΔQRS = 85cm^2, determine the area of Δ ABC.

Indirect Measurement:

Using similar triangles to determine distances that are difficult to measure.

Ex. 3 On a sunny day, Liam, who is 1.7 m tall, stands by a tree, casng a shadow that is 3.5 m long. The tree casts a shadow that is 18.2 m long. How tall is the tree?

Ex. 4 Chelsea is trying to measure the width of a river. She has marked out the following:
How wide is the river?



Homework

Basic: Pg. 347 #1,5,6ad

Regular: Pg. 347 #7,8ad,9,11,19,20

Challenge: Pg. 347 #24