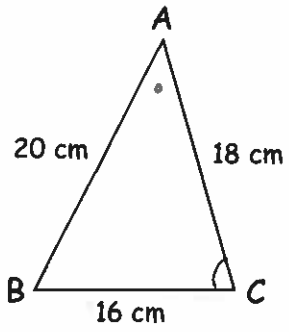
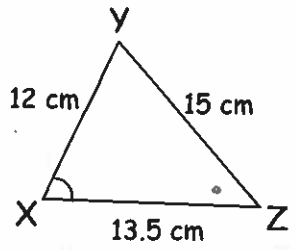
# Trigonometry Review

1. Given the following pair of triangles, state:
   a) The similarity statement.
   b) The scale factor.




match up angles between proportional sides

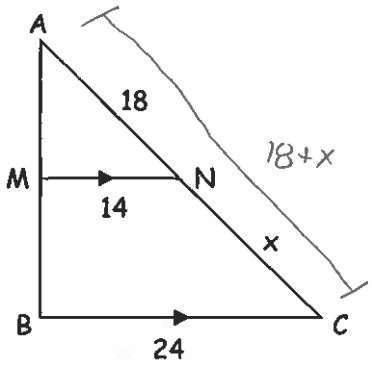
Same order of angles

a) $\triangle ABC \sim \triangle ZYX$

b) $\frac{15}{20} = \frac{13.5}{18} = \frac{12}{16} = 0.75$

OR 1.33 if you do upside down

2. Using the diagram below:
   a) State the similar triangles.
   b) Solve for the unknown value.




a) $\triangle ABC \sim \triangle AMN$

b) $\frac{14}{24} = \frac{18}{18+x}$ cross-multiply

$14(18+x) = 432$

$252 + 14x = 432$

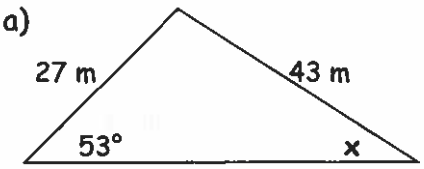
$14x = 432 - 252$

$14x = 180$

$x = 12.9$

3. Solve for the unknown.

a)




Pairs of side-angle = Sine Law

$\frac{\sin 53}{43} = \frac{\sin x}{27}$

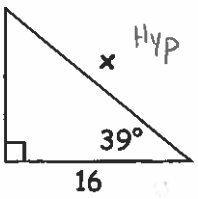
$\frac{27 \sin 53}{43} = \sin x$

$0.5015 = \sin x$

$x = \sin^{-1}(0.5015)$

$= 30.1°$

b)



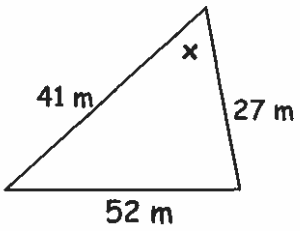

$\cos 39 = \frac{16}{x}$ cross multiply

$x \cos 39 = 16$

$\frac{x \cos 39}{\cos 39} = \frac{16}{\cos 39}$

$x = 20.59$

c)




3 sides = Cosine Law

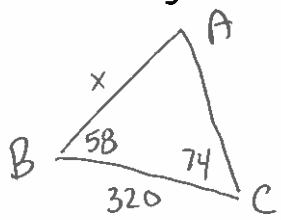
$\cos x = \frac{41^2 + 27^2 - 52^2}{2(41)(27)}$

$\cos x = \frac{-294}{2214}$

$x = \cos^{-1}(-294/2214)$

$= 97.63°$

4. An engineer wants to build a bridge over a river from Point B to point A. The distance from B to a point C is 320 m. A transit is used and ∠B is found to be 58°, ∠C is found to be 74°. How long will the bridge be?




$A = 180 - 74 - 58$
$= 48°$

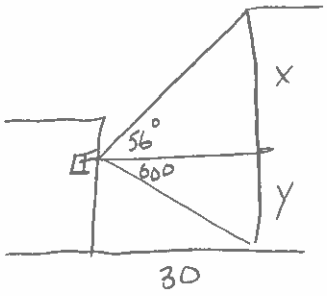
$$\frac{\sin 48}{320} = \frac{\sin 74}{x}$$

$$x \sin 48 = 320 \sin 74$$

$$x = \frac{320 \sin 74}{\sin 48}$$

$$= 413.92 \text{ m}$$

5. From a window of one building, the angle of elevation to the top of a second building is 56°, and the angle of depression to the bottom of that same building is 60°. If the buildings are known to be 30 m apart, find the height of the second building.




$$\tan 56 = \frac{x}{30}$$

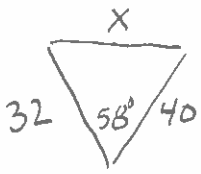
$$x = 30 \tan 56$$
$$= 44.48$$

$$\tan 60 = \frac{y}{30}$$

$$y = 30 \tan 60$$
$$= 51.96$$

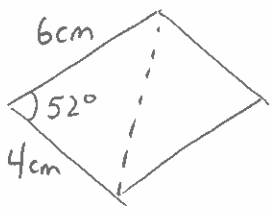
Building $= 44.48 + 51.96$
$= 96.44 \text{ m}$

6. A triangular lot sits at the corner of two streets that intersect at an angle of 58°. One street side of the lot is 32 m and the other is 40 m. How long is the back of the lot (the third side)?




$$x^2 = 32^2 + 40^2 - 2(32)(40) \cos 58$$
$$x^2 = 1267.41$$
$$x = \sqrt{1267.41}$$
$$= 35.6 \text{ m}$$

7. A parallelogram has two adjacent sides of length 4 cm and 6 cm respectively. If the included angle measures 52°, find the area of the parallelogram.




$$\text{Area} = \frac{6(4)\sin 52}{2} \times 2$$ ← each triangle

$$= 18.91 \text{ cm}^2$$

Homework: Pg. 416 #'s: 1-4,9-11,14,16
Pg. 453 #'s: 4,6,10