

1.4 Primary Trig Ratios - Solving for a Missing Side

1) Solve the following equations.

$$a) \frac{x}{4} = 20$$

$$x = 80$$

$$\frac{x}{4} = 20$$

$$b) \frac{12}{x} = 3$$

$$\frac{12}{3} = \frac{3x}{3}$$

$$4 = x$$

$$c) 0.9848 = \frac{x}{5}$$

$$5(0.9848) = x$$

$$x = 4.9$$

2) Evaluate each of the following trig ratios, to four decimal places.

$$a) \tan 45 = 1$$

$$b) \cos 44 = 0.7193$$

$$c) \sin 80 = 0.9848$$

3) Determine the side measure, to 1 decimal place, for the following trig ratios.

$$a) \tan 52 = \frac{x}{4}$$

$$(4) 1.2799 = \frac{x}{4}$$

$$5.1 = x$$

$$4 \cdot \tan 52 = x$$

$$x = 5.1$$

$$b) \cos 78 = \frac{8}{x}$$

$$\frac{x \cdot \cos 78}{\cos 78} = \frac{8}{\cos 78}$$

$$x = \frac{8}{\cos 78^\circ}$$

$$= 38.5$$

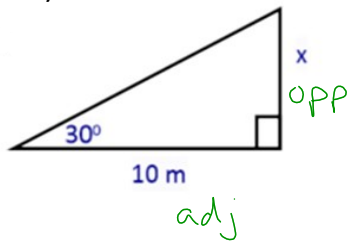
$$x \cdot (0.2079) = 8$$

$$\frac{x \cdot (0.2079)}{0.2079} = \frac{8}{0.2079}$$

$$x = \frac{8}{0.2079}$$

4) Determine the unknown side lengths.

a)



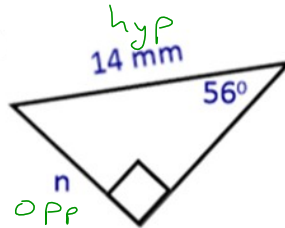
$$\tan \theta = \frac{O}{A}$$

$$(10) \tan 30^\circ = \frac{x}{10}$$

$$x = 10 \cdot \tan 30^\circ$$

$$= 5.8$$

b)



$$\sin \theta = \frac{O}{H}$$

$$\sin 56^\circ = \frac{n}{14}$$

$$(14) \sin 56^\circ = n$$

$$n = 11.6$$

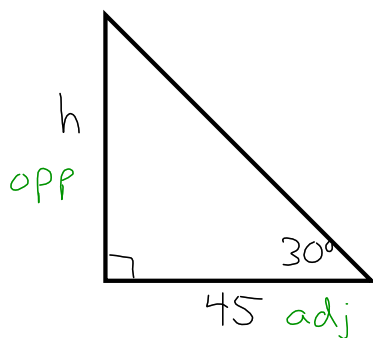
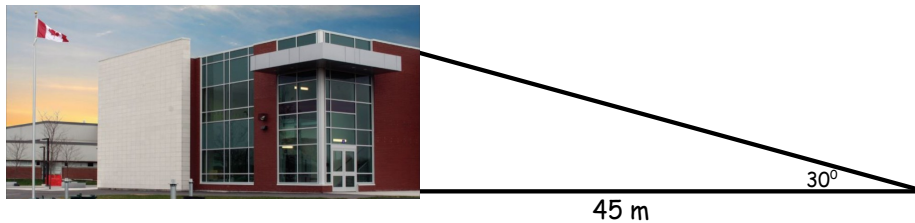
① Label relevant sides

② Choose which ratio

③ Write ratio

④ Replace & Solve

5) From a point 45 m from the base of PDCI the angle of elevation to the top of the school is 30° . What is the height of the school to the nearest metre?



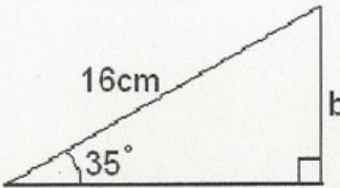
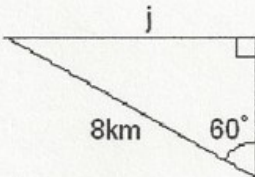
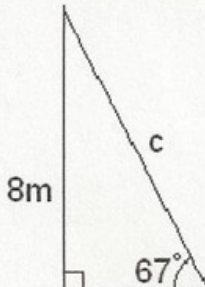
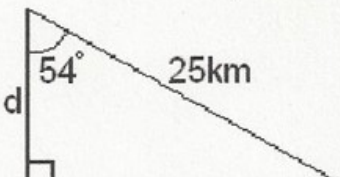
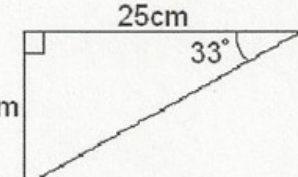
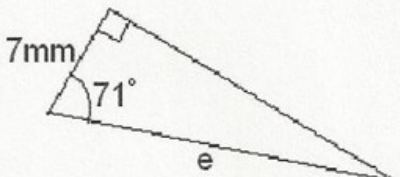
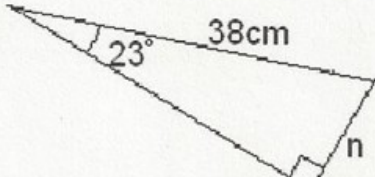
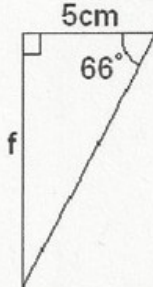
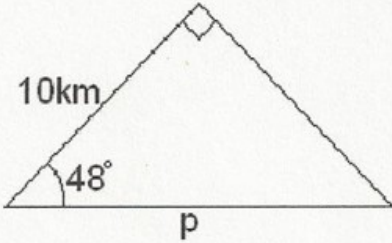
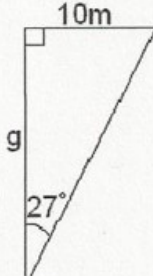
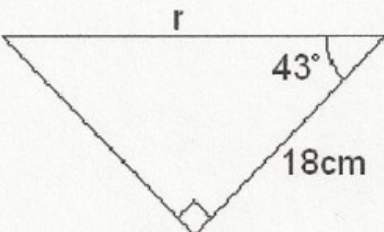
$$\tan \theta = \frac{O}{A}$$

$$\tan 30^\circ = \frac{h}{45}$$

$$(45) \tan 30^\circ = h$$

$$h = 26$$

$\therefore$ The height of the school is 26m

1. 	7. 
2. 	8. 
3. 	9. 
4. 	10. 
5. 	11. 
6. 	12. 

1. $\sin 35^\circ = \frac{b}{16}$ $16 \sin 35^\circ = b$ $b \approx 9.2 \text{ cm}$	7. $\sin 60^\circ = \frac{j}{8}$ $8 \sin 60^\circ = j$ $j \approx 6.9 \text{ km}$
*2. $\sin 67^\circ = \frac{8}{c}$ $c = \frac{8}{\sin 67^\circ}$ $c \approx 8.7 \text{ m}$	8. $\cos 79^\circ = \frac{k}{15}$ $15 \cos 79^\circ = k$ $2.9 \text{ mm} \approx k$
3. $\cos 54^\circ = \frac{d}{25}$ $25 \cos 54^\circ = d$ $d \approx 14.7 \text{ km}$	9. $\tan 33^\circ = \frac{m}{25}$ $25 \tan 33^\circ = m$ $m \approx 16.2 \text{ cm}$
*4. $\cos 71^\circ = \frac{7}{e}$ $e = \frac{7}{\cos 71^\circ}$ $e \approx 21.5 \text{ mm}$	10. $\sin 23^\circ = \frac{n}{38}$ $38 \sin 23^\circ = n$ $14.8 \text{ cm} \approx n$
5. $\tan 66^\circ = \frac{f}{5}$ $5 \tan 66^\circ = f$ $f \approx 11.2 \text{ cm}$	11.* $\cos 48^\circ = \frac{10}{p}$ $p = \frac{10}{\cos 48^\circ}$ $14.9 \text{ km} \approx p$
6. $\tan 27^\circ = \frac{10}{g}$ $g = \frac{10}{\tan 27^\circ}$ $g \approx 19.6 \text{ m}$	12. $\cos 43^\circ = \frac{r}{18}$ $r = \frac{18}{\cos 43^\circ}$ $r \approx 24.6 \text{ cm}$

Homework

Set 1: p. 362 #3ce, 7cd, 13

p. 372 #3fg, 4fg, 6e, 7k, 10ab, 11cf, 15

Set 2: p. 362 #3c, 7c, 13, 16

p. 372 #3f, 4f, 6e, 7k, 10ab, 11cf, 21