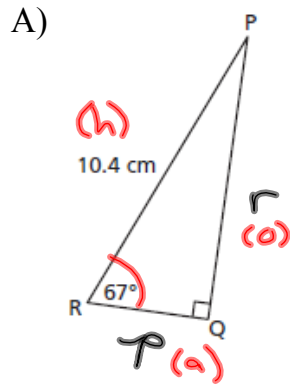


## Section 2.5: Using Sine and Cosine Ratios to Calculate Lengths

Examples:

- Find the length of the missing sides in each triangle.



$$\sin R = \frac{o}{h}$$

$$\frac{\sin 67^\circ}{1} = \frac{r}{10.4}$$

$$r = 10.4 \sin 67^\circ$$

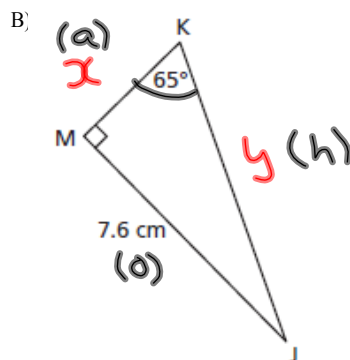
$$r = 9.6 \text{ cm}$$

$$\cos R = \frac{a}{h}$$

$$\frac{\cos 67^\circ}{1} = \frac{p}{10.4}$$

$$p = 10.4 \cos 67^\circ$$

$$p = 4.1 \text{ cm}$$



$$\tan K = \frac{o}{a}$$

$$\frac{\tan 65^\circ}{1} = \frac{7.6}{x}$$

$$\frac{x \tan 65^\circ}{\tan 65^\circ} = \frac{7.6}{\tan 65^\circ}$$

$$x = 3.5 \text{ cm}$$

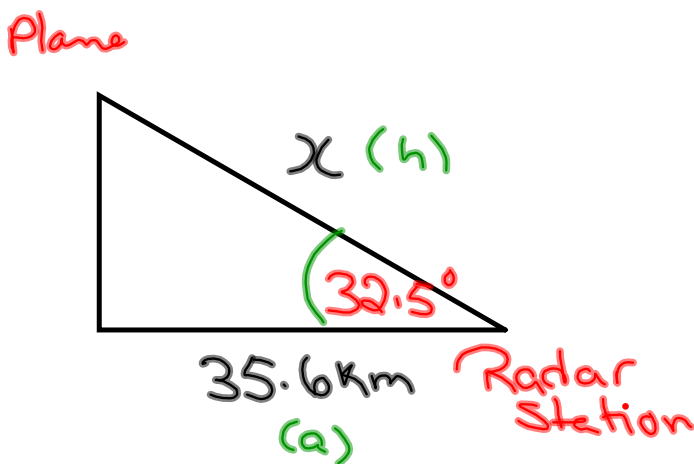
$$\sin K = \frac{o}{h}$$

$$\frac{\sin 65^\circ}{1} = \frac{7.6}{y}$$

$$\frac{y \sin 65^\circ}{\sin 65^\circ} = \frac{7.6}{\sin 65^\circ}$$

$$y = 8.4 \text{ cm}$$

2. From a radar station, the angle of elevation of an approaching airplane is  $32.5^\circ$ . The horizontal distance between the plane and the radar station is 35.6 km. How far is the plane from the radar station to the nearest tenth of a kilometre?



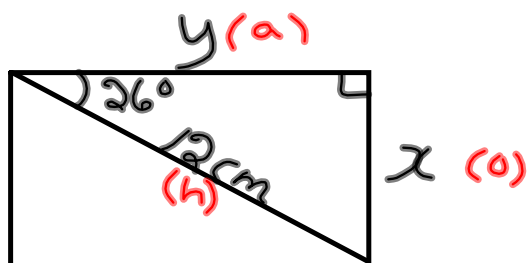
$$\cos \theta = \frac{a}{h}$$

$$\frac{\cos 32.5^\circ}{1} = \frac{35.6}{x}$$

$$\frac{x \cos 32.5^\circ}{\cos 32.5^\circ} = \frac{35.6}{\cos 32.5^\circ}$$

$$\underline{x = 42.2 \text{ km}}$$

3. Determine the perimeter of the rectangle to the nearest tenth of a centimeter.



$$\frac{\sin 26^\circ}{1} = \frac{x}{12}$$

$$x = 12 \sin 26^\circ$$

$$x = 5.3 \text{ cm}$$

$$\frac{\cos 26^\circ}{1} = \frac{y}{12}$$

$$y = 12 \cos 26^\circ$$

$$y = 10.8 \text{ cm}$$

$$P = 2l + 2w$$

$$P = 2(5.3) + 2(10.8)$$

$$P = 10.6 + 21.6$$

$$P = 32.2 \text{ cm}$$

$$P. 111-112 \quad \text{Q } 3-13$$