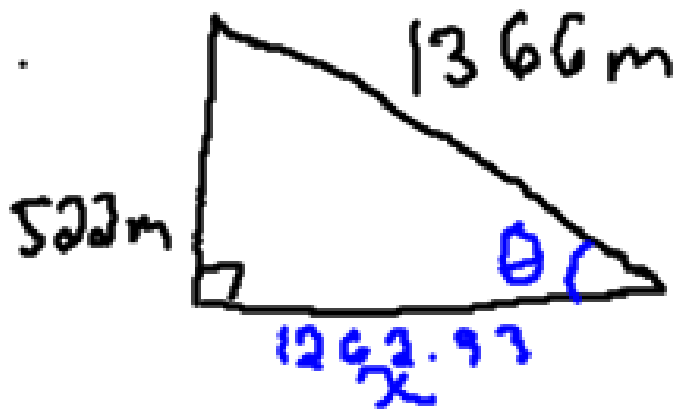


P. 77
18.



$$1366^2 - 522^2 = x^2$$
$$1262.33 \text{ m} = x$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

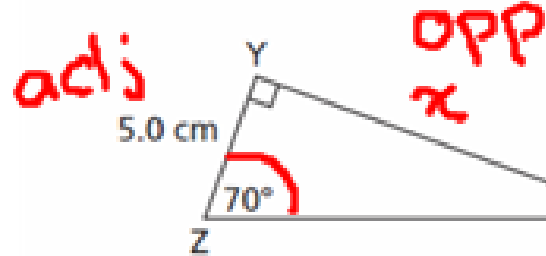
$$\tan \theta = \frac{522}{1262.33}$$

$$\theta = \tan^{-1} \left(\frac{522}{1262.33} \right)$$

$$\theta = 22^\circ$$

2.2 Using the Tangent Ratio to Calculate Lengths

1. Determine the length of XY to the nearest tenth of a centimetre.



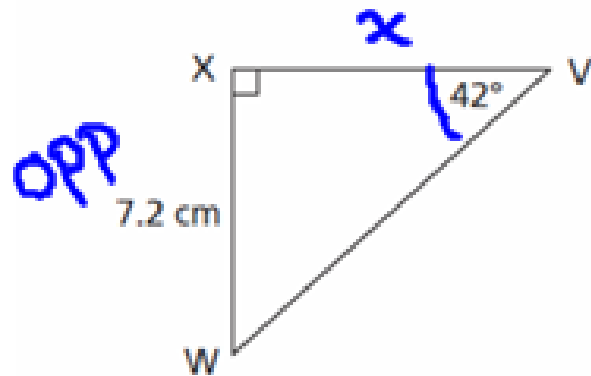
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$(5.0) \cdot \tan(70) = \frac{x}{5.0} \quad (5.0)$$

$$(5.0) \cdot \tan(70) = x$$

$$13.7 \text{ cm} = x$$

2. Determine the length of VX to the nearest tenth of a centimetre.



$$\tan \theta = \frac{\text{opp}}{\text{adj}} \quad * \quad \tan(42) = \frac{7.2}{x}$$

$$x \cdot \tan(42) = \frac{7.2}{\cancel{x}} (x)$$

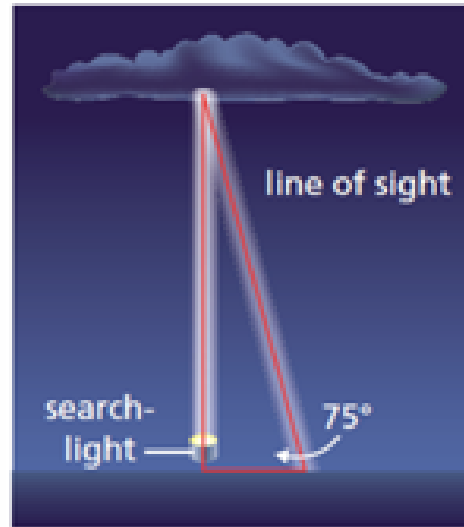
$$\frac{x \cdot \tan(42)}{\tan(42)} = \frac{7.2}{\tan(42)}$$

$$x = \frac{7.2}{\tan(42)}$$

$$x = 7.996 \text{ cm}$$

$$x = 8.0 \text{ cm}$$

A searchlight beam shines vertically on a cloud. At a horizontal distance of 250 m from the searchlight, the angle between the ground and the line of sight to the cloud is 75° . Determine the height of the cloud to the nearest metre.



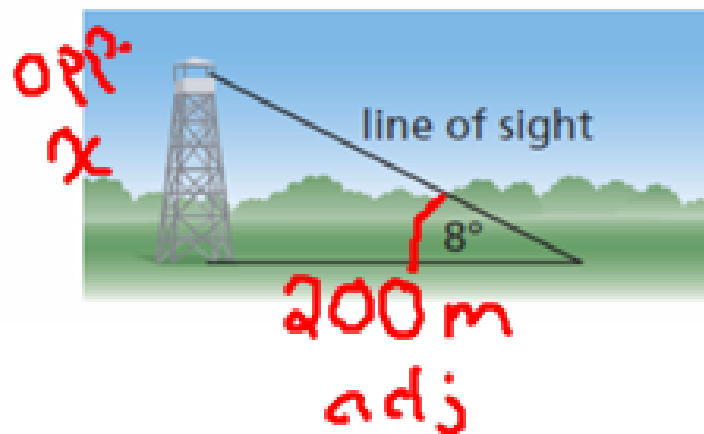
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan(75) = \frac{x}{250}$$

$$250 \cdot \tan(75) = x$$

$$933 \text{ m} = x$$

3. At a horizontal distance of 200 m from the base of an observation tower, the angle between the ground and the line of sight to the top of the tower is 8° . How high is the tower to the nearest metre? The diagram is not drawn to scale.



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

$$\tan(8) = \frac{x}{200}$$

$$200 \cdot \tan(8) = x$$

$$28 \text{ m} = x$$

HW

p. 82 # 3-16