

TT 5. *Foundations and Pre-calculus Mathematics 10* (Pearson), questions 3.b), 9, and 11 on pages 118 and 119. **Possible Solutions**

3. b) $JK = JA + AK$

$$\tan 15^\circ = \frac{JA}{3.0 \text{ cm}}$$

$$JA = (3.0 \text{ cm}) \times \tan 15^\circ$$

$$JA = 0.8 \text{ cm}$$

$$\tan 60^\circ = \frac{AK}{3.0 \text{ cm}}$$

$$AK = (3.0 \text{ cm}) \times \tan 60^\circ$$

$$AK = 5.2 \text{ cm}$$

$$JK = 0.8 \text{ cm} + 5.2 \text{ cm}$$

$$= 6.0 \text{ cm}$$

9. Let x = the height of the smaller tower.

$$\tan 35^\circ = \frac{x}{50 \text{ m}}$$

$$x = (50 \text{ m}) \times \tan 35^\circ$$

$$x = 35 \text{ m}$$

Let y = the portion of the taller tower's height that exceeds the height of the shorter tower.

$$\tan 25^\circ = \frac{y}{50 \text{ m}}$$

$$y = (50 \text{ m}) \tan 25^\circ$$

$$y = 23.3 \text{ m}$$

The height of shorter tower is 35 m. The height of taller tower is $35 \text{ m} + 23.3 \text{ m} = 58.3 \text{ m}$.

11. Let x = the height of the higher carving. Let y = the height of the lower carving. The distance between the carvings will be given by $x - y$.

$$\begin{aligned}\tan 45^\circ &= \frac{x}{15.0 \text{ m}} \\ x &= (15.0 \text{ m}) \tan 45^\circ \\ x &= 15.0 \text{ m}\end{aligned}$$

$$\begin{aligned}\tan 35^\circ &= \frac{y}{15.0 \text{ m}} \\ y &= (15.0 \text{ m}) \tan 35^\circ \\ y &= 10.5 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{So,} \\ x - y &= 15.0 \text{ m} - 10.5 \text{ m} \\ &= 4.5 \text{ m}\end{aligned}$$