In Problems 1-50 to 1-54, solve the given system of linear equations by addition or subtraction

1-52

T sin10° - P sin40° = 0

T cos10° - P cos40° = 200 lb

Solution.

$$\sin 10^\circ T - \sin 40^\circ P = 0 \qquad (1)$$

$$\cos 10^\circ T - \cos 40^\circ P = 200 \text{ lb} \qquad (2)$$

From (1) $$T = \frac{\sin 40^\circ P}{\sin 10^\circ} \qquad (3)$$

subst (3) into (2)

$$\cos 10^\circ \frac{\sin 40^\circ P}{\sin 10^\circ} - \cos 40^\circ P = 200 \text{ lb}$$

$$P = \frac{200 \text{ lb}}{\left[\frac{\cos 10^\circ \sin 40^\circ}{\sin 10^\circ} - \cos 40^\circ\right]}$$

$$= \frac{200 \text{ lb}}{2.879385242}$$

$$= 69.5 \text{ lb}$$

From (3)

$$T = \frac{\sin 40^\circ (69.5 \text{ lb})}{\sin 10^\circ} = 257 \text{ lb}$$

check

$$\sin 10^\circ (257) - \sin 40^\circ (69.5) = 0$$

$$44.6 - 44.6 = 0$$

$$0 = 0 \quad \checkmark$$