

$$8. \quad y = \sin x$$

$$\frac{dx}{dt} = 2 \text{ cm/s}$$

$$\frac{dy}{dt} = \cos x \cdot \frac{dx}{dt}$$

$$a) \quad x = \frac{\pi}{6} \quad \frac{dy}{dt} = 2 \cos \frac{\pi}{6} = 2 \left(\frac{\sqrt{3}}{2} \right) = \boxed{\sqrt{3}}$$

$$b) \quad x = \frac{\pi}{4} \quad \frac{dy}{dt} = 2 \cos \frac{\pi}{4} = 2 \left(\frac{\sqrt{2}}{2} \right) = \sqrt{2}$$

$$c) \quad x = \frac{\pi}{3} \quad \frac{dy}{dt} = 2 \cos \frac{\pi}{3} = 2 \left(\frac{1}{2} \right) = 1$$

$$d) \quad x = \frac{\pi}{2} \quad \frac{dy}{dt} = 2 \cos \frac{\pi}{2} = 2 \cdot 0 = 0$$