

23

$$10.1 \quad \frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$

$$\text{HORIZONTAL: } \frac{dy}{dt} = \cos t = 0$$

$$\frac{\pi}{2} + \pi k$$

$$\text{VERTICAL: } \frac{dx}{dt} = -\sin t = 0$$

$$0 + \pi k$$

$$y = -1 + \sin t$$

$$x = 2 + \cos t$$

$$y = -1 + \sin(0) = -1$$

$$y = -1 + \sin(\pi) = -1$$

$$x = 2 + \cos(0) = 3$$

$$x = 2 + \cos(\pi) = 1$$

5

$$x = \sin t \quad y = \cos(2t)$$

$$x^2 = \sin^2 t \quad y = 1 - 2\sin^2 t$$

$$y = 1 - 2x^2$$

3

$$x = \tan t \quad y = \sec t \quad \sec^2 t = 1 + \tan^2 t$$

$$x^2 = \tan^2 t \quad y^2 = \sec^2 t \quad y^2 = 1 + x^2$$

15

$$x = \ln(2t) \quad y = \ln(3t)^4 = 4 \ln 3t$$

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{\frac{4}{3t} [3]}{\frac{1}{2t} [2]} = \frac{4}{t} \cdot \frac{t}{1} = 4$$

$$\frac{d^2y}{dx^2} = \frac{0}{t} = 0$$