

$$y^3 + y^2 - 5y - x^2 = -4$$

$$\frac{d}{dx} y^3 + \frac{d}{dx} y^2 - \frac{d}{dx} 5y - \frac{d}{dx} x^2 = \frac{d}{dx} (-4)$$

$$3y^2 \frac{dy}{dx} + 2y \frac{dy}{dx} - 5 \frac{dy}{dx} - 2x = 0$$

$$\frac{dy}{dx} (3y^2 + 2y - 5) = 2x$$

$$\frac{dy}{dx} = \frac{2x}{3y^2 + 2y - 5}$$

$$4) \quad x^2 - y^2 = 16$$

$$2x - 2y \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-2x}{-2y}$$

$$\frac{dy}{dx} = \frac{x}{y}$$

$$\frac{dy}{dx} (x + 4\sqrt{xy}) = 2\sqrt{xy} - y$$

$$\frac{dy}{dx} = \frac{2\sqrt{xy} - y}{x + 4\sqrt{xy}}$$

$$5) \quad \sqrt{xy} = x - 2y$$

$$(xy)^{1/2} = x - 2y$$

$$\frac{1}{2} (xy)^{-1/2} \cdot [x \left(\frac{dy}{dx}\right) + y(1)] = 1 - 2 \frac{dy}{dx}$$

$$\frac{1}{2\sqrt{xy}} \cdot (x \frac{dy}{dx} + y) = (1 - 2 \frac{dy}{dx}) \cdot (2\sqrt{xy})$$

$$x \frac{dy}{dx} + y = 2\sqrt{xy} - 4\sqrt{xy} \frac{dy}{dx}$$

$$x \frac{dy}{dx} + 4\sqrt{xy} \frac{dy}{dx} = 2\sqrt{xy} - y$$