

101  
cont.,

$$\frac{dy}{dx} = \frac{2x^{1/2}y^{1/2} - y}{x^{1/2}} \cdot \frac{x^{1/2}}{2x^{1/2}y^{1/2} - x}$$

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

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

102  $y^2 = (x-y)(x^2+y)$

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

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

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

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

$$= \frac{3x^2 + y - 2xy}{4y + x^2 - x}$$

104  $\cos(x+y) = x$

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

$$1 + \frac{dy}{dx} = \frac{1}{-\sin(x+y)}$$

$$\frac{dy}{dx} = -\frac{1}{\sin(x+y)} - 1$$

$$\frac{dy}{dx} = -\csc(x+y) - 1$$

103  $x \sin y = y \cos x$

$$x \cdot \cos y \frac{dy}{dx} + \sin y \cdot 1 = y \cdot (-\sin x) + \cos x \frac{dy}{dx}$$

$$x \cos y \frac{dy}{dx} + \sin y = -y \sin x + \cos x \frac{dy}{dx}$$

$$\sin y + y \sin x = \cos x \frac{dy}{dx} - x \cos y \frac{dy}{dx}$$

$$\frac{\sin y + y \sin x}{\cos x - x \cos y} = \frac{dy}{dx}$$