

$$1. \frac{dy}{dx} = \frac{2x-3x^2y}{x^3+3y^2-\sin y}$$

$$2. \frac{dy}{dx} = \frac{1-e^y}{xe^y+1}$$

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

$$4. y - 1 = \frac{1}{5}(x - 1) \quad (\text{or } y = \frac{1}{5}x + \frac{4}{5})$$

$$5. y = -x$$

$$6. y = -\frac{1}{2}x$$

7.

$$a) \frac{dy}{dx} = \frac{x(2x+1)^3}{\sqrt{x-2}} \left(\frac{1}{x} + \frac{6}{2x+1} - \frac{1}{2(x-2)} \right)$$

$$b) \frac{dy}{dx} = \frac{\sqrt[4]{x} \cdot (2x^3+1)^2}{e^{\tan^{-1}x}} \left(\frac{1}{4x} + \frac{12x^2}{2x^3+1} - \frac{1}{1+x^2} \right)$$

$$c) \frac{dy}{dx} = \frac{(x-1)^4 \sqrt{2x+1}}{x^6} \left(\frac{4}{x-1} + \frac{1}{2x+1} - \frac{6}{x} \right)$$

$$d) \frac{dy}{dx} = x^x (1 + \ln x)$$

$$e) \frac{dy}{dx} = x^{\cos x} \left(\frac{\cos x}{x} - \sin x \ln x \right)$$

$$f) \frac{dy}{dx} = (\cos x)^{\sqrt{x}} \left(-\sqrt{x} \tan x + \frac{\ln(\cos x)}{2\sqrt{x}} \right)$$

$$g) \frac{dy}{dx} = (\sin x)^{\frac{1}{x}} \left(\frac{x \cot x - \ln(\sin x)}{x^2} \right)$$

Review

8.

$$a) \frac{dy}{dx} = \frac{1}{2\sqrt{\ln x}} + \sqrt{\ln x}$$

$$b) \frac{dy}{dx} = \frac{-5x^4 \sin(\log_2(x^5+1))}{(x^5+1) \ln 2}$$

$$c) f'(x) = \frac{3}{|3x-2|\sqrt{(3x-2)^2-1}}$$

$$d) f'(t) = \frac{\tan^{-1} \sqrt{t}}{\sqrt{t}(1+t)}$$