

1)

$$a) y = 9 = \frac{y'}{dx} (9) = 0$$

$$b) y = x^8 =$$

$$y' = \frac{d}{dx} (x^n) = n \cdot x^{n-1} = 8x^{8-1} = 8x^7$$

$$c) y = 4x^8 = y' = 4 \cdot \frac{d}{dx} (x^8) \quad y' = 4 \cdot 8x^{8-1} = 32x^7$$

$$d) y = \pi x^2 \quad y' = \pi \frac{d}{dx} (x^2) \quad y' = 2\pi x$$

$$e) y = 14 - \frac{1}{2x^3} \quad y' = \frac{d}{dx} (14) - \frac{d}{dx} \left(\frac{1}{2x^3} \right)$$

$$y' = 0 - \left(\frac{2 \cdot 3x^2}{(2x^3)^2} \right) \quad y' = \frac{2 \cdot 3x^2}{4x^6} = \frac{3x^2}{2x^4}$$

$$y' = \frac{3}{2x^2}$$

$$f) y = x^7 \quad y' = 7x^{7-1} \quad y' = 7x^6$$

$$g) y = 3x^4 \quad y' = 3 \cdot 4x^{4-1} \quad y' = 12x^3$$

$$h) y = \frac{x^3}{\pi} \quad y' = \frac{1}{\pi} \cdot \frac{d}{dx} (x^3) \quad y' = \frac{1}{\pi} \cdot 3x^2$$

$$y' = \frac{3x^2}{\pi}$$

$$i) y = 8x^2 \quad y' = 8 \cdot 2x^{2-1} \quad y' = 16x$$

$$j) y = 3x^2 + 6x - 10 \quad y' = 3 \cdot 2x^{2-1} + 6 - 0$$

$$y' = 6x + 6$$

$$k) y = aw^2 + B \quad y' = a \cdot 2w^{2-1}$$

$$y' = a2w + 1$$

$$l) y = e^x \quad y' = e^x$$

$$m) y = 5 \quad y' = 0$$

$$n) y = x^{1000} \quad y' = 1000 \cdot x^{1000-1} \quad y' = 1000x^{999}$$

$$o) y = \sqrt{x} \quad y' = \frac{D(\sqrt{x})}{Dx} \quad y' = \frac{1}{2\sqrt{x}}$$

$$p) y = x^{\frac{1}{2}} \quad y' = \frac{1}{2} x^{\frac{1}{2}-1} \quad y' = \frac{1}{2\sqrt{x}}$$

$$q) y = \left(\frac{2}{5}\right)^x \quad y' = \frac{D(2^x)}{Dx} \cdot 5^{-x-2^x} \cdot \frac{D(5^x)}{Dx}$$

$$y' = \frac{\ln(2) \cdot 2^x - \ln(5) \cdot 2^x}{5^x}$$

$$r) y = 3^x \quad y' = \frac{D(3^x)}{Dx} \quad y' = \ln(3) \cdot 3^x$$

$$s) y = 3x^2 + 5 \quad y' = \frac{d}{dx}(3x^2) + \frac{d}{dx}5$$

$$y' = 3 \cdot 2x + 0$$

$$y' = 6x$$

$$f) y = 2\sqrt[3]{x} \quad y' = \frac{d}{dx}(2x^{\frac{1}{3}}) \Rightarrow y' = 2 \cdot \frac{d}{dx}(x^{\frac{1}{3}})$$

$$y' = 2 \cdot \frac{1}{3} x^{\frac{1}{3}-1} \Rightarrow y' = \frac{2}{3\sqrt[3]{x^2}}$$

$$u) y = \frac{4}{x} + \frac{5}{x^2} \quad y' = \frac{d}{dx}\left(\frac{4}{x}\right) + \frac{d}{dx}\left(\frac{5}{x^2}\right)$$

$$y' = -4 \cdot \frac{1}{x^2} - 5 \cdot \frac{2}{x^3}$$

$$y' = \frac{-4x - 10}{x^3}$$

$$v) y = e^{3x} \quad g = 3x \quad y' = \frac{d}{dg}(e^g) \cdot \frac{d}{dx}(3x)$$

$$y' = e^g \cdot 3$$

$$y' = e^{3x} \cdot 3$$

$$y' = 3e^{3x}$$

$$w) y = e^{-5x} \quad g = -5x \quad y' = \frac{d}{dg}(e^g) \cdot \frac{d}{dx}(-5x)$$

$$y' = e^g \cdot -5$$

$$y' = e^{-5} \cdot -5$$

$$y' = -\frac{5}{e^{5x}}$$