

a.

$$1.) \textcircled{A} y = \frac{x^2}{2x+1}$$

$$y = \frac{u}{v}$$

$$y' = \frac{u'v - v'u}{v^2}$$

$$u = x^2 \quad u' = 2x$$

$$v = 2x+1 \quad v' = 2$$

$$y' = \frac{[2x(2x+1) - (2x^2)]}{(2x+1)(2x+1)}$$

$$y' = \frac{(4x^2 + 2x) - (2x^2)}{4x^2 + 4x + 1}$$

$$y' = \frac{2x^2 + 2x}{4x^2 + 4x + 1} \text{ or } \frac{2x(x+1)}{(2x+1)^2}$$

$$1.) \textcircled{B} y = \sqrt{x^2+1}$$

$$y = (x^2+1)^{\frac{1}{2}}$$

$$y' = \frac{1}{2} (x^2+1)^{-\frac{1}{2}}$$

$$\frac{x^2+1}{2\sqrt{x^2+1}}$$

$$\frac{2x+0}{2\sqrt{x^2+1}} \left(\frac{x}{\sqrt{x^2+1}} \right)$$

$$\frac{3}{x^2} = 3 \cdot \frac{d}{dx} \left[\frac{1}{x^2} \right] \\ 3 \cdot (-2) x^{-3} \\ = -\frac{6}{x^3}$$

$$1. 3a) y = 3x^{\frac{3}{2}} + \frac{3}{2}x^2 - 6x$$

$$y = 3x^{\frac{3}{2}} + \frac{3}{2}x^2 - 6x$$

$$y' = \frac{9}{2}x^{\frac{1}{2}} + \frac{6}{2}x - 6$$

$$y' = \frac{9\sqrt{x}}{2} + \frac{6}{2}x - 6$$

$$1.) \textcircled{B} \sec^3 4x$$

$$\frac{3 \tan^2 4x}{12 \tan^2 x}$$

$$3 \cdot \frac{d}{dx} \sec 4x \sec^2$$

$$3 \cdot \sec 4x \tan 4x \cdot \sec^2 4x$$

$$y' = 12 \sec^3 4x \cdot \tan 4x$$

$$12 \sec^3 (4x) \tan (4x)$$

$\therefore$

$$y' = 12 \sec^3 4x \cdot \tan 4x$$

$$1.) \textcircled{E} y = (x + \sin 2x)$$

$$y = 1 + \sin 2x$$

$$y = 1 + 2 \cos 2x$$

$$y' = 2 \cos (2x) + 1$$