

-Sec 9.5: The product Rule and Quotient Rule:

find the derivative:-

$$\boxed{4} \quad y = (3x^7 + 4)(8x^6 - 6x^4 - 9)$$

$$\begin{aligned} \frac{dy}{dx} &= (3x^7 + 4)(8(6)x^5 - 6(4)x^3) + (8x^6 - 6x^4 - 9)(3(7)x^6) \\ &= (3x^7 + 4)(48x^5 - 24x^3) + 21x^6(8x^6 - 6x^4 - 9) \end{aligned}$$

$$\boxed{8} \quad y = \left(\sqrt[5]{x} - 2\sqrt{x} + 1 \right) (x^3 - 5x - 7)$$

$\frac{1}{5}x^{\frac{1}{5}} \quad - \frac{2}{2}x^{\frac{1}{2}}$

$$\begin{aligned} y' &= \left(\frac{1}{5}x^{-\frac{4}{5}} - 2\left(\frac{1}{2}\right)x^{-\frac{1}{2}} + 0 \right) (3x^2 - 5) + (x^3 - 5x - 7) \left(\frac{1}{5}x^{-\frac{4}{5}} - 2\left(\frac{1}{2}\right)x^{-\frac{3}{2}} \right) \\ &= \left(\frac{1}{5}x^{-\frac{4}{5}} - 2\sqrt{x} + 1 \right) (3x^2 - 5) + (x^3 - 5x - 7) \left(\frac{1}{5x^{\frac{4}{5}}} - \frac{1}{2x^{\frac{3}{2}}} \right) \end{aligned}$$

$$\boxed{12} \quad \text{C}(x) = \frac{2x^3}{3x^4 + 2}$$

$$C'(x) = \frac{(3x^4 + 2)(2(3)x^2) - 2x^3(3(4)x^3)}{(3x^4 + 2)^2}$$

$$= \frac{6x^2(3x^4 + 2) - 24x^6}{(3x^4 + 2)^2}$$

$$= \frac{18x^6 + 12x^2 - 24x^6}{(3x^4 + 2)^2} = \frac{-12x^6 + 12x^2}{(3x^4 + 2)^2}$$