

1. Find the derivative of these functions.

(a) $y = (x^4 + 8x^3)^5$

$$y' = 5(x^4 + 8x^3)^4 * (4x^3 + 24x^2)$$

(b) $y = 5^{(x^4+9x)}$

$$y' = (4x^3 + 9)5^{(x^4+9x)} \ln(5)$$

(c) $y = \frac{x^5 + 1}{x^7 - 2}$

$$y' = \frac{(x^7 - 2) * 5x^4 - (x^5 + 1) * 7x^6}{(x^7 - 2)^2}$$

2. The total profit in dollars for producing and selling x items is given by $P(x)$. Explain what $P'(85) = 143$ means in context of the items being made and sold.

The approximate profit for the 86th item is \$143.