

1. Find the derivative of these functions.

(a)  $y = (x^5 + 7x^2)^3$

$$y' = 3(x^5 + 7x^2)^2 * (5x^4 + 14x)$$

(b)  $y = 4^{(x^3+5x)}$

$$y' = (3x^2 + 5)4^{(x^3+5x)} \ln(4)$$

(c)  $y = \frac{x^6 + 8}{x^3 - 5}$

$$y' = \frac{(x^3 - 5) * 6x^5 - (x^6 + 8) * 3x^2}{(x^3 - 5)^2}$$

2. The total profit in dollars for producing and selling  $x$  items is given by  $P(x)$ .

Explain what  $P'(255) = 325$  means in context of the items being made and sold.

The approximate profit for the 256<sup>th</sup> item is \$325.