

1. Find the derivative of these functions.

$$(a) y = 15\sqrt[3]{x^7} - 5x^{1.4} + 8^4 = 15x^{7/3} - 5x^{1.4} + 8^4$$

$$y' = 15\left(\frac{7}{3}\right)x^{4/3} - 5(1.4)x^{0.4}$$

$$y' = 35x^{4/3} - 7x^{0.4}$$

$$(b) y = \frac{2x^5 - 3x^4 + 7}{x^3}$$

$$y = (2x^5 - 3x^4 + 7)x^{-3} = 2x^2 - 3x + 7x^{-3}$$

$$y' = 4x - 3 - 21x^{-4}$$

$$(c) y = (x^4 + 6)\sqrt{x} = x^{4.5} + 6x^{0.5}$$

$$y' = 4.5x^{3.5} + 6 * 0.5x^{-0.5}$$

$$y' = 4.5x^{3.5} + 3x^{-0.5}$$

2. Find the equation of the tangent line at the point (2, 79) for $J(x) = x^6 + 7x + 1$

$$J'(x) = 6x^5 + 7$$

$$m = J'(2) = 199$$

$$y - 79 = 199(x - 2) \text{ or } y = 199x - 319$$