

1. Find the derivative of these functions.

(a) $y = (x^5 + 2)\sqrt{x}$

$$y = x^{5.5} + 2x^{0.5}$$

$$y' = 5.5x^{4.5} + 2 * 0.5x^{-0.5}$$

$$y' = 5.5x^{4.5} + x^{-0.5}$$

(b) $y = 12\sqrt[4]{x^5} + 8x^{2.5} + 7^4$

$$y = 12x^{5/4} + 8x^{2.5} + 7^4$$

$$y' = 12\left(\frac{5}{4}\right)x^{1/4} + 8 * 2.5x^{1.5}$$

$$y' = 15x^{1/4} + 20x^{1.5}$$

(c) $y = \frac{4x^6 - 2x^8 + 1}{x^5}$

$$y = (4x^6 - 2x^8 + 1)x^{-5} = 4x - 2x^3 + x^{-5}$$

$$y' = 4 - 6x^2 - 5x^{-6}$$

2. Find the equation of the tangent line at the point (3, 235) for $J(x) = x^5 - x^2 + 1$

$$J'(x) = 5x^4 - 2x$$

$$m = J'(3) = 399$$

$$y - 235 = 399(x - 3) \text{ or } y = 399x - 962$$