

1. Find y' for the following functions. [Do *not* simplify your answers.]

[2] (a) $y = 3x^{1/3} - 2x^{1/2}$

[2] (b) $y = 4x^5 - \frac{2}{x^2} + \sqrt{x}$

[3] (c) $y = (x^3 + x)(x + e)$

[3] (d) $y = (2x^2 + e) \left(\sqrt{x} + \frac{1}{x} \right)$

[4] (e) $y = \frac{\sqrt{x}}{x^3 + 1}$

[4] (f) $y = \frac{4x^3 - 6x}{3x - 5}$

[4] 2. Let $f(x) = x^2 + 2x$. Write the equation of the line tangent to f at the point where $x = 1$.

[4] 3. Let $f(x) = x^3 + 3x^2 + 1$. Write the equation of the line tangent to f at the point where $x = 1$.

[7] 4. Let $f(x) = \sqrt{1 - x}$. Using *only* the definition of the derivative, find $f'(x)$.

[7] 5. Let $f(x) = \sqrt{2 + 3x}$. Using *only* the definition of the derivative, find $f'(x)$.