1. Differentiate the following using the *Limit definition of the derivative.*

a) $f(x) = 3x^2 + 4x$
                                                       b) $f(x) = \dfrac{x+1}{3x-2}$

2. Power Rule: (*write all answers with positive exponents!*)

a) $h(x) = 7x^5$
                                                       b) $f(x) = 4\sqrt{x}$

3. Sum and Difference Rule: (*write all answers with positive exponents!*)

a) $y = x^{10} + 20x^5 - 12\sqrt[4]{x^3} + 30$
                          b) $f(x) = \sqrt{x} + \sqrt[3]{x} + \sqrt[4]{x}$

4. Product Rule:

a) $y = (4x^2 - 2)(3x + 5)$

b) $g(x) = (x^2 - 3x + 4)(2x^2 + 4x)$

5. Quotient Rule:

a) $f(x) = \dfrac{2x^2}{3x + 5}$

b) $y = \dfrac{x^2 + 3x + 3}{x + 1}$

6. For the function, $y = (1 + x)^{10}$, **find the (i)** *Slope of the tangent* **and (ii)** *Equation of the tangent* **at** $x = 0$