Calculus 12
6-2 Questions

1. Differentiate the following functions.

a) $f(x) = x^2 + 4x$

b) $f(x) = 3x^5 - 6x^4 + 2$

c) $xg(\ ) = x^{10} + 25x^5 - 50$

d) $g(x) = x^2 - \dfrac{2}{x^2}$

e) $h(x) = \sqrt{x} - 5x^4$

f) $h(x) = (x-1)(x+6)$

g) $y = \dfrac{x+1}{\sqrt{x}}$

h) $y = t^5 - 6t^{-5}$

i) $f(t) = (1+t)^3$

j) $F(x) = \sqrt{x} + \sqrt[3]{x} + \sqrt[4]{x}$

k) $u(t) = a + \dfrac{b}{t} + \dfrac{c}{t^2}$

l) $v(r) = \sqrt{r}(2+3r)$

2. Find $f'(x)$ and state the domains of f and f'.

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

b) $f(x) = 4x - \sqrt[4]{x}$

c) $f(x) = x + \dfrac{\sqrt{10}}{x^5}$

d) $f(x) = \sqrt{x} + \dfrac{2}{\sqrt{x}}$

3. Find the equation of the tangent line to the curve at the given point.

a) $y = x^3 - x^2 + x - 1,\ (1,0)$

b) $y = 7\sqrt{x} - 3x,\ (1,4)$

c) $y = x + \dfrac{6}{x},\ (2,5)$

d) $y = (x^2+1)^2,\ (-1,4)$

4. If a ball is thrown upward with a velocity of 40 m/s its height in metres after t seconds is $h = 40t - 5t^2$. Find the velocity of the ball after 2 s, 4 s, and 5 s.