Math 121 HW #8

Section 4.1 # 20, 29, 38

Section 4.2 # 2, 20

4.1 #20 $f(x) = \frac{x^3+5}{x} = \frac{x^3}{x} + \frac{5}{x} = x^2 + 5x^{-1}$

So $f'(x) = 2x - 5x^{-2}$

4.1 #29 $f(x) = \frac{x^4}{6} - 3x$

So $f'(x) = \frac{4}{6}x^3 - 3$

So $f'(-2) = \frac{4}{6}(-2)^3 - 3 = \frac{2}{3}\cdot 8 - 3 = -\frac{16}{3} - 3 = -\frac{25}{3}$

4.1 #38 Where is tangent line horizontal for $f(x) = x^3 + 15x^2 + 63x - 10$?

$f'(x) = 3x^2 + 30x + 63$, set = to 0.

So $3x^2 + 30x + 63 = 0$,

$x^2 + 10x + 21 = 0$

$(x+3)(x+7) = 0$

$x = -7$ and $x = -3$.

4.2 #2 $y = (5x^2 - 1)(4x+3)$

$\frac{dy}{dx} = (5x^2-1)\cdot 4 + (4x+3)(10x)$

4.2 #20 $k(x) = \frac{x^2+7x-2}{x^2-2}$

$k'(x) = \frac{(x^2-2)(2x+7) - (x^2+7x-2)\cdot(2x)}{(x^2-2)^2}$.