Calculus 120

orksheet: Differentiation Rules
Do not simplify your derivatives .

1. Differentiate: *(Easy!)*

(a) $f(x) = 3x^4 + 3x^3 + 1$

(b) $y = \dfrac{4x+1}{6-2x^2}$

(c) $f(x) = 3(2x^3 + x - 5)^{10}$

(d) $h(x) = (x^3 - x)\sqrt{4-9x}$

2. Differentiate: *(Getting a little tougher!)*

(a) $y = \dfrac{2}{x} + \dfrac{3}{5x^3} - 6\sqrt{x} + \sqrt[4]{9x^2} - 8\pi$

(b) $y = \sqrt{\dfrac{1-x^4}{2+(5x-1)^5}}$

(c) $g(x) = (x-5)^3(7x^3 +2x)^5(4-2x^3)^4$

(d) $f(x) = \sqrt{25 + 4(2x-1)^5}$

3. Differentiate: *(Now let's have some fun!)*

(a) $y = \sqrt{x^3 - 5x\sqrt{2x^3 + 3\sqrt{x}}}$

(b) $f(x) = \dfrac{8x^3(12x^3 - 5x)^7}{2 - 3\sqrt{1-32x^{10}}}$

(c) $f(x) = \dfrac{\left[x^3 - x\sqrt{4-x^2}\right]^5}{12\sqrt{x}(5x^3 -8)^3}$