AP Calculus
3.3 Worksheet Day 1

All work must be shown in this course for full credit. Unsupported answers may receive NO credit.

1. A derivative tells you the Slope of a function.

2. What is the power rule for derivatives? (i.e. how do you take the derivative of $y = x^n$?)

$y' = n x^{n-1}$

3. For each of the following functions, find $\frac{dy}{dx}$.

a) $y = -2x^3 + x$

$\frac{dy}{dx} = -6x^2 + 1$

b) $y = \frac{x^4}{3} - \frac{x^2}{7} + 5$

$\frac{dy}{dx}$

c) $y = \frac{5}{x^2} + \frac{6}{x} - 8x^3$

d) $y = \frac{x^{-3}}{2} + 5x^{-4} - 3x^{-6}$

e) $y = 5x^4 + 2x^3 - 8x^2 - 7x + 11$

f) $y = 7x - 8$

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

h) $y = \frac{x^5 - 2x^4 + 3x^3}{x^5}$

i) $y = \sqrt{x} + \frac{3}{\sqrt{x}} - 6x^{\frac{5}{3}} + \frac{7}{x^3}$

4. [Calculator Required] We want to find all points where the graph of $y = x^4 - 5x^3 - 3x^2 + 13x + 10$ has a horizontal tangent line.

a) First, find an equation for y' .

b) A horizontal tangent line will have a slope = _____ . So set $y' =$ _____, and use your calculator to solve this equation.