Name: _____ **AP**

Classwork 38

1. a) Write the limit definition of a derivative.

b) Write the two points we are using to create that limit as ordered pairs.

c) Why do we let **h** go to zero?

2. a) Show that the derivative of $f(x) = \sqrt{x}$ is $f'(x) = \frac{1}{2\sqrt{x}}$ using the definition. **(review of of yesterday)**

b) Write the original function using an exponent.

c) Write the answer using an exponent.

d) What do you notice?

3. Find the derivative of each function using the rule.

a) $y = \frac{1}{x^7}$

b) $y = \frac{6}{x^4}$

c) $y = 3\sqrt[3]{x}$

d) $y = 10\sqrt[5]{x^8}$

e) $y = 2x^{-1/4}$

f) $y = 20x^{1/5}$

g) $y = 9x^{-3/2}$

h) $y = 9\sqrt[3]{x} + \frac{4}{x^4} + 7x - x^2$

i) $y = 7/x^{-3}$

j) $y = 6\sqrt[2]{x^6}$

k) $y = 4x^5 - 1/2x^4 + 3x^{-2} + 7x + 9$

l) $y = \frac{x^4}{4}$

m) $y = \frac{6}{x^5 + x^3}$

n) $y = \sqrt{x^7 + x^2}$