Name: _____ **TC**

Classwork 33

1. Find the derivative of each function using the definition.

a) $f(x) = 5x$

b) $f(x) = x - 2$

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

a) $f(x) = x^7$

b) $f(x) = x^2 + 3x$

c) $f(x) = x^5 - x^4 + 8$

3. Find the slope of each of the functions above at $x = 2$

a)

b)

c)

4. When does the function $y = x^3$ have a slope of 48?

5. Fill out each chart.

x	x^3	Δy	x	$2x^3$	Δy	x	$3x^3$	Δy	x	$4x^3$	Δy
0			0			0			0		
1			1			1			1		
2			2			2			2		
3			3			3			3		
4			4			4			4		
5			5			5			5		

What happens to the rate of change when you put a coefficient in front of the function?

6. a) Predict the derivative of $y = 5x^3$

b) Use the definition to prove that this derivative is correct.

7. a) Write a general rule for the derivative of a function $f(x) = Cx^n$

b) Prove that this rule is actually correct using the definition of a derivative.

8. Find the equation of the tangent line to each point at the given value. Then graph both functions to show you are correct.

a) Tangent to the equation $y = 2x^3$ at $x = 1$

b) Tangent to the equation $y = 1/2x^4$ at $x = 2$

c) Tangent to the equation $y = (x^4)/4$

9. Find the derivative of $f(x) = \frac{1}{x^2}$ using the definition.

Practice Problems

1. Find the derivative of $y = 5x^4 + 7x - 8$
2. Find the derivative of $y = -2x^3 - 8x^2 + 7x$
3. Find the derivative of $y = \frac{1}{x^3}$