

NAME: _____

DATE: _____

DERIVATIVE AND INTEGRAL PRACTICE
POLYNOMIALS

$$f(x) = \sum Cx^n,$$

$$\text{slope} = \sum nCx^{n-1}$$

$$\text{area} = \int f(x) dx = \frac{1}{n+1} Cx^{n+1}$$

Calculate the (1) slope and (2) area under the graph.

1. $f(x) = -3x$

$$f'(x) = -3(1)x^0 = -3$$

2. $f(x) = -4x^3$

$$f'(x) = -4(3)x^2 = -12x^2$$

3. $f(x) = -x^6$

$$f'(x) = -6x^5$$

4. $f(x) = -x^6 - 4x^3 - 3x$

$$f'(x) = -6x^5 - 12x^2 - 3$$

5. $f(x) = 5x^3 - 2x^2 + 10x - 15$

$$f'(x) = 15x^2 - 4x + 10$$

6. $f(x) = 4x^3 - 2x^5$

$$f'(x) = 12x^2 - 10x^4$$

7. $f(x) = x + \frac{1}{2}x^4 - \frac{3}{4}x^3 + 10$

$$f'(x) = 1 + 2x^3 - \frac{9}{4}x^2$$

8. $f(x) = \pi x^4 + \sqrt{6}$

$$f'(x) = 4\pi x^3$$

9. $f(x) = 7x - \sqrt{3} + \pi x^2$

$$f'(x) = 7 + 2\pi x$$

10. $f(x) = x^5 + \frac{1}{2}x^{1/2} - \frac{3}{4}x^{-1/4} + x^{-2} + 10x^{-9}$

$$f'(x) = 5x^4 + \frac{1}{4}x^{-1/2} + \frac{3}{16}x^{-5/4} - 2x^{-3} - 90x^{-10}$$