

## Derivative Review

For each problem, find the following values

- 1) Find the derivative of

$$f(x) = -x^3 + 2x^2 + 4 \text{ at } x = 2$$

- 2) Find the slope of

$$f(x) = -x^2 - 6x - 5 \text{ at } x = 0$$

For each problem, find the equation of the line tangent or normal to the function at the given point. Your answer should be in slope-intercept form.

- 3) Tangent line of

$$f(x) = -x^3 + 2x^2 - 3 \text{ at } (2, -3)$$

- 4) Normal line of

$$f(x) = -x^2 - 4x - 3 \text{ at } (-3, 0)$$

For each problem, find the following

- 5) Find the point(s) where the slope of

$$f(x) = x^3 - 3x^2 - 1 \text{ equals } 0.$$

- 6) Find the point(s) where the slope of

$$f(x) = 2x^2 - 3x + 4 \text{ equals } 5.$$

Differentiate each function with respect to  $x$ .

7)  $f(x) = 3x^5 + 2x^2 + 1$

8)  $f(x) = -3x^4 + 4x + 10\sqrt{x}$

$$9) f(x) = 2x^5 + 3x^2 + 6\sqrt[3]{x}$$

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

For each problem, find the indicated derivative with respect to  $x$ .

$$11) f(x) = 2x^5 - 5x^4 - x^2 + 3x \quad \text{Find } f''$$

$$12) f(x) = \frac{3}{x^5} + 4e^x \quad \text{Find } f''$$

Differentiate each function with respect to  $x$ .

$$13) f(x) = -3x^4(-5x^5 + 2)$$

$$14) f(x) = (2x^4 + 4)(-2x^4 + x^2 + 2)$$

$$15) f(x) = \frac{4x^5}{3x^2 + 3}$$

$$16) f(x) = \frac{5x^2 + 5}{2x^4 - 3}$$

$$17) f(x) = (-4x^4 + 3)^4$$

$$18) f(x) = (3x + 2)^2$$

$$19) f(x) = e^{2x^4}$$

$$20) f(x) = \ln 2x^5$$

$$21) f(x) = \sin 5x^2$$

$$22) f(x) = 2\tan 5x$$

$$23) f(x) = e^{3x} \cos 5x^3$$