

## Derivatives Problem Set #1

**Differentiate each function with respect to  $x$ .**

1)  $f(x) = \frac{2}{x^2} + \frac{1}{x^3}$

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

3)  $f(x) = 4$

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

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

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

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

8)  $f(x) = 4x^5 - \frac{4}{5}x^4 + 4x^{-1}$

9)  $f(x) = -\frac{2}{5x^3} - \frac{2}{3}x^{-5}$

10)  $f(x) = x$

11)  $f(x) = (-x^3 + 5) \cdot 2x^5$

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

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

$$14) f(x) = (x^4 + 3)(x^5 + 5x^4 - 4)$$

$$15) f(x) = (x^5 - 5x^3 - 2)(2x^4 - 3)$$

$$16) f(x) = (-5x^5 + 3)(4x^3 + 2x^2 + 5)$$

$$17) f(x) = -2x^3(x^2 + 5)$$

$$18) f(x) = (5x^5 - 5x^3 + 2)(3x^4 - 2)$$

$$19) f(x) = (5x^4 - 1) \cdot 2x^5$$

$$20) f(x) = (4x^2 + 4)(4x^5 + 4x^3 + 4)$$