

Basic Differentiation Rules

Date _____ Period _____

Differentiate each function with respect to the given variable.

1) $g(x) = -5$

2) $g = -\frac{3}{2}x^7$

3) $g = -5 - \frac{1}{10s^2}$

4) $y = -\frac{10}{3r^8} + \frac{7}{3r^{10}}$

5) $g(s) = -\frac{3}{4}\sqrt[8]{s} + \frac{4}{s^2} - \frac{4}{7s^5}$

6) $f = -\frac{3}{8}t$

7) $f = -\frac{3}{2x^6}$

8) $r = -\frac{7}{2}x^{\frac{7}{8}} - \frac{4}{5} + 4x^{-7}$

$$9) f(x) = \sqrt[7]{x^3} - 4\sqrt[10]{x^3}$$

$$10) y = \frac{5}{4}r^4$$

$$11) h(x) = \frac{3}{5}x^4$$

$$12) f(x) = -\frac{3}{2}\sqrt[7]{x^5} - 1 + \frac{5}{3x^5}$$

$$13) h = 2x^{\frac{2}{7}}$$

$$14) t = \frac{7}{5}r^6 + \frac{9}{r^7}$$

$$15) h = -4t^{\frac{5}{4}} + \frac{1}{2} - \frac{1}{3t^6}$$

$$16) r = \frac{5}{4}x^8 - \frac{1}{9} - \frac{5}{4}x^{-1}$$

$$17) \quad t = -\frac{1}{5}r^6 - r^{\frac{3}{2}} - r^{-7}$$

$$18) \quad f = -\frac{4}{s^3} + \frac{1}{s^4}$$

$$19) \quad h = 7r^{\frac{3}{10}}$$

$$20) \quad h(x) = -7x^2 + \frac{9}{4}$$

Differentiate each function with respect to x .

$$21) \quad y = -4x^3(-4x^4 + 3)$$

$$22) \quad y = (3x^5 + 2) \cdot -2x^3$$

$$23) \quad y = (5x^5 + 5)(3x^4 + 5)$$

$$24) \quad f(x) = (-5x^3 - 3)(-5x^4 + 5)$$

$$25) f(x) = (-3x^5 - 3)(2x^5 - 2x^4 - 4)$$

$$26) f(x) = (-4x^3 - 4)(-3x^3 - 2x^2 + 5)$$

$$27) y = \frac{4x^2}{5x^5 - 5}$$

$$28) f(x) = \frac{3}{3x^3 + 5}$$

$$29) y = \frac{x^5 - x^2}{5x^4 + 4}$$

$$30) y = \frac{2x^2 + 5}{x^2 - 2}$$