Differentiation - Power, Constant, and Sum Rules

Date_____ Period____

Differentiate each function with respect to *x*.

1) $y = 5$

2) $f(x) = 5x^{18}$

3) $y = 4x^5 + x$

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

5) $y = 3x^{\frac{5}{4}}$

6) $y = \frac{5}{4}x^{\frac{2}{3}}$

7) $y = -4x^{-5}$

8) $y = \frac{3}{x^3}$

9) $y = x^{\frac{2}{3}}$

10) $f(x) = -2\sqrt[4]{x}$

11) $y = \frac{2}{3}x^4 + 5x - x^{-3}$

12) $y = -\frac{1}{2}x^4 + 3x^{\frac{5}{3}} + 2x$

Differentiate each function with respect to the given variable.

13) $y = -3r^5 - 5r^2$

14) $f(s) = -\frac{3}{s^2} - \frac{4}{s^4}$

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

16) $h(s) = \sqrt{2} \cdot \sqrt[3]{s} + \sqrt{2} \cdot \sqrt[5]{s}$

Differentiate each function with respect to *x*. Problems may contain constants a, b, and c.

17) $y = 5c$

18) $y = 4ax^{3a} - bx^{3c}$