Differentiation (... Practice Set 1)

Differentiation - Power, Constant, and Sum Rules

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

Answers

Differentiate each function with respect to *x*.

1)
$$y = 5$$

 $\frac{dy}{dx} = 0$
2) $f(x) = 5x^{18}$
 $f'(x) = 90x^{17}$
3) $y = 4x^5 + x$
 $\frac{dy}{dx} = 20x^4 + 1$
5) $y = 3x^{\frac{5}{4}}$
 $\frac{dy}{dx} = \frac{15x^{\frac{1}{4}}}{4}$
 $\frac{dy}{dx} = \frac{5}{4}x^{\frac{2}{3}}$
 $\frac{dy}{dx} = \frac{5}{4}x^{-\frac{1}{3}}$
 $\frac{dy}{dx} = \frac{5}{4}x^{-\frac{1}{3}}$
 $\frac{dy}{dx} = \frac{5}{4}x^{-\frac{1}{3}}$
 $\frac{dy}{dx} = \frac{5}{4}x^{-\frac{1}{3}}$
 $\frac{dy}{dx} = \frac{20x^{-6}}{x^6}$
 $\frac{dy}{dx} = 20x^{-6}$
 $\frac{20}{x^6}$
 $\frac{dy}{dx} = 2x^{-4}$
 $\frac{dy}{dx} = -9x^{-4}$
 $\frac{-9}{x^4}$
 $\frac{dy}{dx} = -9x^{-4}$
 $\frac{-9}{x^4}$
 $\frac{dy}{dx} = -9x^{-4}$
 $\frac{-9}{x^4}$
 $\frac{dy}{dx} = -9x^{-4}$
 $\frac{-9}{x^4}$
 $\frac{dy}{dx} = -2x^{4}x^{\frac{5}{4}}$
 $\frac{dy}{dx} = -2x^3 + 5x^{\frac{3}{4}} + 2x$
 $\frac{dy}{dx} = -2x^3 + 5x^{\frac{3}{4}} + 2x$

Differentiation (... Practice Set 1)

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.

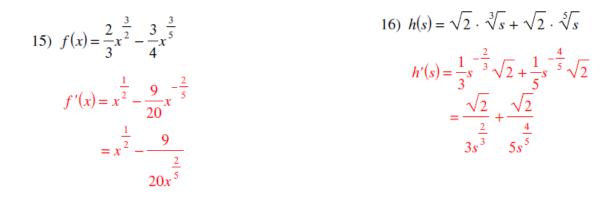
17)
$$y = 5c$$
 18) $y = 4ax^{3a} - bx^{3c}$

Differentiation (... Practice Set 1)

Answers

Differentiate each function with respect to the given variable.

13) $y = -3r^5 - 5r^2$ $\frac{dy}{dr} = -15r^4 - 10r$ $f'(s) = 6s^{-3} + 16s^{-5}$ $= \frac{6}{s^3} + \frac{16}{s^5}$



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

17) y = 5c $\frac{dy}{dx} = 0$ $\frac{dy}{dx} = 12a^2x^{3a-1} - 3bcx^{3c-1}$