Name_____

Differentiation (Power Rule)

Date_____

Differentiate each function with respect to x.

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

2) $y = 4x^3 + 2x^2 - 4x$

3) $y = 2x^5 + 2x^3 + 5x^2$

4) $y = 2x^5 + 4x^4 + 4x^2$

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

5) $y = -bx^5 - 3bx^2$

6) $y = -ax^4 + 3bx^3$

Differentiate each function with respect to x.

7) $y = -\dfrac{1}{2}\sqrt[3]{x} - \dfrac{4}{3}x^{-4}$

8) $y = 4\sqrt[4]{x} + 4\sqrt[5]{x}$

9) $y = 3x^{-3} + 5x^{-5}$

10) $y = -\sqrt[4]{x} + 3\sqrt[5]{x}$

Answers to Differentiation (Power Rule) (ID: 1)

1) $\dfrac{dy}{dx} = 5x^4 + 12x^3 + 3$

2) $\dfrac{dy}{dx} = 12x^2 + 4x - 4$

3) $\dfrac{dy}{dx} = 10x^4 + 6x^2 + 10x$

4) $\dfrac{dy}{dx} = 10x^4 + 16x^3 + 8x$

5) $\dfrac{dy}{dx} = -5bx^4 - 6bx$

6) $\dfrac{dy}{dx} = -4ax^3 + 9bx^2$

7) $\dfrac{dy}{dx} = -\dfrac{1}{6x^{\frac{2}{3}}} + \dfrac{16}{3x^5}$

8) $\dfrac{dy}{dx} = \dfrac{1}{x^{\frac{3}{4}}} + \dfrac{4}{5x^{\frac{4}{5}}}$

9) $\dfrac{dy}{dx} = -\dfrac{9}{x^4} - \dfrac{25}{x^6}$

10) $\dfrac{dy}{dx} = -\dfrac{1}{4x^{\frac{3}{4}}} + \dfrac{3}{5x^{\frac{4}{5}}}$