

## Assignment- Chain rule

Date \_\_\_\_\_ Period \_\_\_\_\_

Differentiate each function with respect to  $x$ .

1)  $y = (-2x^4 + 1)^4$

2)  $y = (2x^5 - 3)^3$

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

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

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

6)  $y = (x^2 - 2)^{\frac{1}{3}}$

7)  $y = (-2x^5 + 3)^{-3}$

8)  $y = (2x^5 - 1)^{\frac{1}{5}}$

9)  $y = (x^5 + 4)^{-5}$

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

## Answers to Assignment- Chain rule (ID: 1)

$$1) \frac{dy}{dx} = 4(-2x^4 + 1)^3 \cdot -8x^3 \\ = -32x^3(-2x^4 + 1)^3$$

$$2) \frac{dy}{dx} = 3(2x^5 - 3)^2 \cdot 10x^4 \\ = 30x^4(2x^5 - 3)^2$$

$$3) \frac{dy}{dx} = 3(-3x^5 + 4)^2 \cdot -15x^4 \\ = -45x^4(-3x^5 + 4)^2$$

$$4) \frac{dy}{dx} = \frac{1}{4}(5x^2 + 3)^{-\frac{3}{4}} \cdot 10x \\ = \frac{5x}{2(5x^2 + 3)^{\frac{3}{4}}}$$

$$5) \frac{dy}{dx} = \frac{1}{5}(-x^3 + 3)^{-\frac{4}{5}} \cdot -3x^2 \\ = -\frac{3x^2}{5(-x^3 + 3)^{\frac{4}{5}}}$$

$$6) \frac{dy}{dx} = \frac{1}{3}(x^2 - 2)^{-\frac{2}{3}} \cdot 2x \\ = \frac{2x}{3(x^2 - 2)^{\frac{2}{3}}}$$

$$7) \frac{dy}{dx} = -3(-2x^5 + 3)^{-4} \cdot -10x^4 \\ = \frac{30x^4}{(-2x^5 + 3)^4}$$

$$8) \frac{dy}{dx} = \frac{1}{5}(2x^5 - 1)^{-\frac{4}{5}} \cdot 10x^4 \\ = \frac{2x^4}{(2x^5 - 1)^{\frac{4}{5}}}$$

$$9) \frac{dy}{dx} = -5(x^5 + 4)^{-6} \cdot 5x^4 \\ = -\frac{25x^4}{(x^5 + 4)^6}$$

$$10) \frac{dy}{dx} = \frac{1}{3}(-x^4 + 3)^{-\frac{2}{3}} \cdot -4x^3 \\ = -\frac{4x^3}{3(-x^4 + 3)^{\frac{2}{3}}}$$

