

Name : \_\_\_\_\_

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

## Chain Rule

Differentiate each function.

1)  $y = -\frac{3}{2}(x - 7)^5$

2)  $y = 4(5x^2 - 3)^4$

3)  $y = 3\sqrt{(4x^2 - 1)^5}$

4)  $f(x) = -5(-5x - 7)^3$

5)  $y = \frac{4}{3}(6x^3 - 7x)^4$

6)  $y = \frac{2}{3}(7x - 5)^3$

7)  $f(x) = 5(6x^3 + 5x)^4$

8)  $f(x) = \frac{2}{3}(5x - 6)^4$

9)  $f(x) = -\frac{4}{3}(x^3 - 6x)^3$

10)  $f(x) = -\frac{1}{2}\sqrt{(-2x^2 - 7)^5}$



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## Chain Rule

Differentiate each function.

1)  $y = -\frac{3}{2}(x - 7)^5$

$$\frac{dy}{dx} = \left(-\frac{15}{2}\right)(x - 7)^4$$

2)  $y = 4(5x^2 - 3)^4$

$$\frac{dy}{dx} = (160x)(5x^2 - 3)^3$$

3)  $y = 3\sqrt{(4x^2 - 1)^5}$

$$\frac{dy}{dx} = (60x)\sqrt{(4x^2 - 1)^3}$$

4)  $f(x) = -5(-5x - 7)^3$

$$f'(x) = (75)(-5x - 7)^2$$

5)  $y = \frac{4}{3}(6x^3 - 7x)^4$

$$\frac{dy}{dx} = \left(96x^2 - \frac{112}{3}\right)(6x^3 - 7x)^3$$

6)  $y = \frac{2}{3}(7x - 5)^3$

$$\frac{dy}{dx} = (14)(7x - 5)^2$$

7)  $f(x) = 5(6x^3 + 5x)^4$

$$f'(x) = (360x^2 + 100)(6x^3 + 5x)^3$$

8)  $f(x) = \frac{2}{3}(5x - 6)^4$

$$f'(x) = \left(\frac{40}{3}\right)(5x - 6)^3$$

9)  $f(x) = -\frac{4}{3}(x^3 - 6x)^3$

$$f'(x) = (-12x^2 + 24)(x^3 - 6x)^2$$

10)  $f(x) = -\frac{1}{2}\sqrt{(-2x^2 - 7)^5}$

$$f'(x) = (5x)\sqrt{(-2x^2 - 7)^3}$$

