

Find the derivatives using the General Power Rule ('Chain Rule' for power functions), Product Rule, and/or Quotient Rule, whichever apply. When simplifying, only multiply monomial factors together. You do not have to factor your answers.

1.  $y = (4x - x^5)^7$

$$y' = 7(4x - x^5)^6 (4 - 5x^4)$$

(1)
(1)
(1)
(1)
(1)
(1)

6

2.  $y = \sqrt[3]{(5x^2 - 4)^8} = (5x^2 - 4)^{8/3}$  (1)

$$y' = \frac{8}{3}(5x^2 - 4)^{5/3} (10x) = \frac{80}{3}x(5x^2 - 4)^{5/3}$$

(1)
(1)
(1)
(1)
(1)

7

3.  $f(x) = (6x + 5)(2x - 1)^7$

$$f'(x) = (6x + 5)(7)(2x - 1)^6 (2) + (2x - 1)^7 (6)$$

$$= 14(6x + 5)(2x - 1)^6 + 6(2x - 1)^7$$

(1)

10

23

Find the derivatives using the General Power Rule ('Chain Rule' for power functions), Product Rule, and/or Quotient Rule, whichever apply. When simplifying, only multiply monomial factors together. You do not have to factor your answers.

1.  $y = (7x - x^3)^6$

$$y' = 6(7x - x^3)^5 (7 - 3x^2)$$

2.  $y = \sqrt[6]{(7x^2 - 4)^5} = (7x^2 - 4)^{5/6}$  ①

$$y' = \frac{5}{6} (7x^2 - 4)^{-1/6} (14x) = \frac{70}{6} x (7x^2 - 4)^{-1/6}$$

↑ or  $\frac{35}{3}$

3.  $f(x) = (8x + 5)(3x - 1)^5$

$$\begin{aligned} f'(x) &= (8x + 5)(5)(3x - 1)^4(3) + (3x - 1)^5(8) \\ &= 15(8x + 5)(3x - 1)^4 + 8(3x - 1)^5 \end{aligned}$$

Find the derivatives using the General Power Rule ('Chain Rule' for power functions), Product Rule, and/or Quotient Rule, whichever apply. When simplifying, only multiply monomial factors together. You do not have to factor your answers.

1.  $y = (3x - x^4)^5$

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

2.  $y = \sqrt[5]{(3x^2 - 4)^7} = (3x^2 - 4)^{7/5}$

$$y' = \frac{7}{5} (3x^2 - 4)^{2/5} (6x) = \frac{42}{5} x (3x^2 - 4)^{2/5}$$

3.  $f(x) = (2x + 5)(5x - 1)^9$

$$\begin{aligned} f'(x) &= (2x + 5)(9)(5x - 1)^8(5) + (5x - 1)^9(2) \\ &= 45(2x + 5)(5x - 1)^8 + 2(5x - 1)^9 \end{aligned}$$

Find the derivatives using the General Power Rule ('Chain Rule' for power functions), Product Rule, and/or Quotient Rule, whichever apply. When simplifying, only multiply monomial factors together. You do not have to factor your answers.

1.  $y = (3x - x^5)^7$

$$y' = 7(3x - x^5)^6 (3 - 5x^4)$$

2.  $y = \sqrt[3]{(9x^2 - 8)^7} = (9x^2 - 8)^{7/3}$

$$y' = \frac{7}{3}(9x^2 - 8)^{4/3} (18x) = \frac{126}{3}x(9x^2 - 8)^{4/3}$$

↑ or  
42x

3.  $f(x) = (7x + 3)(2x - 1)^8$

$$f'(x) = (7x + 3)(8)(2x - 1)^7(2) + (2x - 1)^8(7)$$

$$= 16(7x + 3)(2x - 1)^7 + 7(2x - 1)^8$$

Find the derivatives using the General Power Rule ('Chain Rule' for power functions), Product Rule, and/or Quotient Rule, whichever apply. When simplifying, only multiply monomial factors together. You do not have to factor your answers.

1.  $y = (9x - x^4)^8$

$$y' = 8(9x - x^4)^7 (9 - 4x^3)$$

2.  $y = \sqrt[4]{(5x^2 - 3)^7} = (5x^2 - 3)^{7/4}$

$$y' = \frac{7}{4} (5x^2 - 3)^{3/4} (10x) = \frac{70}{4} x (5x^2 - 3)^{3/4}$$

or  $\frac{35}{2} x (5x^2 - 3)^{3/4}$

3.  $f(x) = (4x + 5)(3x - 1)^7$

$$f'(x) = (4x + 5)(7)(3x - 1)^6 (3) + (3x - 1)^7 (4)$$

$$= 21(4x + 5)(3x - 1)^6 + 4(3x - 1)^7$$