



# Derivative Rules - Quotient Rule Negative Fractional Powers (with Rule) to

## Derivative

1 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

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

A  $f'(x) = \frac{(-3x^{-\frac{5}{2}})(3x) + (2x^{-\frac{3}{2}} - 4)(3)}{(3x)^2}$

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

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

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

2 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$f(x) = \frac{-5x^{-\frac{1}{2}} + 2}{2x - 4}$$

A  $f'(x) = \frac{(\frac{5}{2}x^{-\frac{3}{2}})(2x - 4) - (-5x^{-\frac{1}{2}} + 2)(2)}{(2x - 4)^2}$

B  $f'(x) = \frac{(\frac{5}{2}x^{-\frac{3}{2}})(2x - 4) + (-5x^{-\frac{1}{2}} + 2)(2)}{(2x - 4)^2}$

C  $f'(x) = \frac{(-5x^{-\frac{1}{2}} + 2)(2) - (\frac{5}{2}x^{-\frac{3}{2}})(2x - 4)}{(2x - 4)^2}$

D  $f'(x) = \frac{(\frac{5}{2}x^{-\frac{3}{2}})(2x - 4) - (-5x^{-\frac{1}{2}} + 2)(2)}{(2x - 4)}$

3 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$f(x) = \frac{-2x^{-\frac{2}{3}} + 7}{-4x^2}$$

A  $f'(x) = \frac{(\frac{4}{3}x^{-\frac{5}{3}})(-4x^2) + (-2x^{-\frac{2}{3}} + 7)(-8x)}{(-4x^2)^2}$

B  $f'(x) = \frac{(-2x^{-\frac{2}{3}} + 7)(-8x) - (\frac{4}{3}x^{-\frac{5}{3}})(-4x^2)}{(-4x^2)^2}$

C  $f'(x) = \frac{(\frac{4}{3}x^{-\frac{5}{3}})(-4x^2) - (-2x^{-\frac{2}{3}} + 7)(-8x)}{(-4x^2)^2}$

D  $f'(x) = \frac{(\frac{4}{3}x^{-\frac{5}{3}})(-4x^2) - (-2x^{-\frac{2}{3}} + 7)(-8x)}{(-4x^2)}$

4 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$f(x) = \frac{2x^{-\frac{1}{3}} - 7}{4x}$$

A  $f'(x) = \frac{(-\frac{2}{3}x^{-\frac{4}{3}})(4x) - (2x^{-\frac{1}{3}} - 7)(4)}{(4x)^2}$

B  $f'(x) = \frac{(2x^{-\frac{1}{3}} - 7)(4) - (-\frac{2}{3}x^{-\frac{4}{3}})(4x)}{(4x)^2}$

C  $f'(x) = \frac{(-\frac{2}{3}x^{-\frac{4}{3}})(4x) - (2x^{-\frac{1}{3}} - 7)(4)}{(4x)^2}$

D  $f'(x) = \frac{(-\frac{2}{3}x^{-\frac{4}{3}})(4x) + (2x^{-\frac{1}{3}} - 7)(4)}{(4x)^2}$

5 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$f(x) = \frac{3x^{-\frac{1}{3}} + 3}{-5x^2}$$

A  $f'(x) = \frac{(-x^{-\frac{4}{3}})(-5x^2) - (3x^{-\frac{1}{3}} + 3)(-10x)}{(-5x^2)^2}$

B  $f'(x) = \frac{(3x^{-\frac{1}{3}} + 3)(-10x) - (-x^{-\frac{4}{3}})(-5x^2)}{(-5x^2)^2}$

C  $f'(x) = \frac{(-x^{-\frac{4}{3}})(-5x^2) + (3x^{-\frac{1}{3}} + 3)(-10x)}{(-5x^2)^2}$

D  $f'(x) = \frac{(-x^{-\frac{4}{3}})(-5x^2) - (3x^{-\frac{1}{3}} + 3)(-10x)}{(-5x^2)^2}$

6 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

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

A  $f'(x) = \frac{(-\frac{15}{2}x^{-\frac{5}{2}})(-5x^2) - (5x^{-\frac{3}{2}} - 5)(-10x)}{(-5x^2)^2}$

B  $f'(x) = \frac{(-\frac{15}{2}x^{-\frac{5}{2}})(-5x^2) - (5x^{-\frac{3}{2}} - 5)(-10x)}{(-5x^2)}$

C  $f'(x) = \frac{(5x^{-\frac{3}{2}} - 5)(-10x) - (-\frac{15}{2}x^{-\frac{5}{2}})(-5x^2)}{(-5x^2)^2}$

D  $f'(x) = \frac{(-\frac{15}{2}x^{-\frac{5}{2}})(-5x^2) + (5x^{-\frac{3}{2}} - 5)(-10x)}{(-5x^2)^2}$

7 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

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

A  $f'(x) = \frac{(x^{-\frac{4}{3}})(3x^2 - 5) - (-3x^{-\frac{1}{3}} + 7)(6x)}{(3x^2 - 5)^2}$

B  $f'(x) = \frac{(-3x^{-\frac{1}{3}} + 7)(6x) - (x^{-\frac{4}{3}})(3x^2 - 5)}{(3x^2 - 5)^2}$

C  $f'(x) = \frac{(x^{-\frac{4}{3}})(3x^2 - 5) + (-3x^{-\frac{1}{3}} + 7)(6x)}{(3x^2 - 5)^2}$

D  $f'(x) = \frac{(x^{-\frac{4}{3}})(3x^2 - 5) - (-3x^{-\frac{1}{3}} + 7)(6x)}{(3x^2 - 5)}$

8 Find the derivative  $f'(x)$  using the quotient rule.

$$\text{if } h(x) = \frac{f(x)}{g(x)}, h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$f(x) = \frac{-4x^{-\frac{1}{2}} - 2}{2x + 6}$$

A  $f'(x) = \frac{(2x^{-\frac{3}{2}})(2x + 6) - (-4x^{-\frac{1}{2}} - 2)(2)}{(2x + 6)^2}$

B  $f'(x) = \frac{(-4x^{-\frac{1}{2}} - 2)(2) - (2x^{-\frac{3}{2}})(2x + 6)}{(2x + 6)^2}$

C  $f'(x) = \frac{(2x^{-\frac{3}{2}})(2x + 6) - (-4x^{-\frac{1}{2}} - 2)(2)}{(2x + 6)^2}$

D  $f'(x) = \frac{(2x^{-\frac{3}{2}})(2x + 6) + (-4x^{-\frac{1}{2}} - 2)(2)}{(2x + 6)^2}$