



# Derivative Rules - Quotient Rule Negative Fractional Powers as Radical to Derivative

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

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

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

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

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

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

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

$$f(x) = \frac{4}{\sqrt[3]{x^4}} - 3$$

A  $f'(x) = \frac{(-\frac{16}{3}x^{-\frac{7}{3}})(-5x^2) - (4x^{-\frac{4}{3}} - 3)(-10x)}{(-5x^2)^2}$

B  $f'(x) = \frac{(4x^{-\frac{4}{3}} - 3)(-10x) - (-\frac{16}{3}x^{-\frac{7}{3}})(-5x^2)}{(-5x^2)^2}$

C  $f'(x) = \frac{(-\frac{16}{3}x^{-\frac{7}{3}})(-5x^2) + (4x^{-\frac{4}{3}} - 3)(-10x)}{(-5x^2)^2}$

D  $f'(x) = \frac{(-\frac{16}{3}x^{-\frac{7}{3}})(-5x^2) - (4x^{-\frac{4}{3}} - 3)(-10x)}{(-5x^2)}$

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

$$f(x) = \frac{5}{\sqrt[3]{x}} - 2$$

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

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

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

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

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

$$f(x) = \frac{3}{\sqrt[3]{x}} - 3$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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