



Derivative Rules - Quotient Rule Positive Fractional Powers (with Rule) to Derivative

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

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

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

A $f'(x) = \frac{(3x^{\frac{1}{2}})(-4x^2 - 2) + (2x^{\frac{3}{2}} + 6)(-8x)}{(-4x^2 - 2)^2}$

B $f'(x) = \frac{(3x^{\frac{1}{2}})(-4x^2 - 2) - (2x^{\frac{3}{2}} + 6)(-8x)}{(-4x^2 - 2)^2}$

C $f'(x) = \frac{(3x^{\frac{1}{2}})(-4x^2 - 2) - (2x^{\frac{3}{2}} + 6)(-8x)}{(-4x^2 - 2)}$

D $f'(x) = \frac{(2x^{\frac{3}{2}} + 6)(-8x) - (3x^{\frac{1}{2}})(-4x^2 - 2)}{(-4x^2 - 2)^2}$

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

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

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

A $f'(x) = \frac{(\frac{8}{3}x^{-\frac{1}{3}})(3x - 4) - (4x^{\frac{2}{3}} + 4)(3)}{(3x - 4)^2}$

B $f'(x) = \frac{(\frac{8}{3}x^{-\frac{1}{3}})(3x - 4) + (4x^{\frac{2}{3}} + 4)(3)}{(3x - 4)^2}$

C $f'(x) = \frac{(\frac{8}{3}x^{-\frac{1}{3}})(3x - 4) - (4x^{\frac{2}{3}} + 4)(3)}{(3x - 4)}$

D $f'(x) = \frac{(4x^{\frac{2}{3}} + 4)(3) - (\frac{8}{3}x^{-\frac{1}{3}})(3x - 4)}{(3x - 4)^2}$

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

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

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

A $f'(x) = \frac{(4x^{-\frac{1}{2}} + 0)(-3x^2 + 5) - (4x^{\frac{1}{2}} + 6)(-6x)}{(-3x^2 + 5)^2}$

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

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

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

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

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

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

A $f'(x) = \frac{(3x^{-\frac{3}{5}} - 0)(5x^2 + 2) - (3x^{\frac{2}{5}} - 5)(10x)}{(5x^2 + 2)^2}$

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

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

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

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

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

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

A $f'(x) = \frac{(4x^{\frac{1}{3}})(-4x^2) + (3x^{\frac{4}{3}} + 7)(-8x)}{(-4x^2)^2}$

B $f'(x) = \frac{(3x^{\frac{1}{3}} + 7)(-8x) - (4x^{\frac{1}{3}})(-4x^2)}{(-4x^2)^2}$

C $f'(x) = \frac{(4x^{\frac{1}{3}})(-4x^2) - (3x^{\frac{4}{3}} + 7)(-8x)}{(-4x^2)}$

D $f'(x) = \frac{(4x^{\frac{1}{3}})(-4x^2) - (3x^{\frac{4}{3}} + 7)(-8x)}{(-4x^2)^2}$

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

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

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

A $f'(x) = \frac{(\frac{20}{3}x^{\frac{1}{3}})(-2x - 4) - (5x^{\frac{4}{3}} + 5)(-2)}{(-2x - 4)^2}$

B $f'(x) = \frac{(5x^{\frac{1}{3}} + 5)(-2) - (\frac{20}{3}x^{\frac{1}{3}})(-2x - 4)}{(-2x - 4)^2}$

C $f'(x) = \frac{(\frac{20}{3}x^{\frac{1}{3}})(-2x - 4) - (5x^{\frac{4}{3}} + 5)(-2)}{(-2x - 4)}$

D $f'(x) = \frac{(\frac{20}{3}x^{\frac{1}{3}})(-2x - 4) + (5x^{\frac{4}{3}} + 5)(-2)}{(-2x - 4)^2}$

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

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

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

A $f'(x) = \frac{(\frac{16}{3}x^{-\frac{1}{4}})(-4x^2 + 7) - (4x^{\frac{3}{4}} + 6)(-8x)}{(-4x^2 + 7)^2}$

B $f'(x) = \frac{(4x^{\frac{3}{4}} + 6)(-8x) - (\frac{16}{3}x^{-\frac{1}{4}})(-4x^2 + 7)}{(-4x^2 + 7)^2}$

C $f'(x) = \frac{(\frac{16}{3}x^{-\frac{1}{4}})(-4x^2 + 7) + (4x^{\frac{3}{4}} + 6)(-8x)}{(-4x^2 + 7)^2}$

D $f'(x) = \frac{(\frac{16}{3}x^{-\frac{1}{4}})(-4x^2 + 7) - (4x^{\frac{3}{4}} + 6)(-8x)}{(-4x^2 + 7)^2}$

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

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

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

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

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

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

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