Derivatives — Quotient rule

Name: _____ Date: _____

Find f'(x) with the quotient rule: u'v − uv', all over v².

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

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

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

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

4. $f(x) = \frac{3x - 1}{3x + 1}$

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

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

Derivatives · Quotient rule — Answer key

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

2. $f(x) = \frac{2x - 2}{3x + 3} \rightarrow f'(x) = \frac{12}{(3x + 3)^2}$

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

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

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

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