

Quotient Rule

Differentiate each quotient. Keep the original denominator restriction.

$$1. \quad y = \frac{6 \cdot x + 4}{-1 \cdot x^2 + 2 \cdot x + 5}$$

$$2. \quad y = \frac{6 \cdot x^2 + 7 \cdot x + 8}{-5 \cdot x - 6}$$

$$3. \quad y = \frac{5 \cdot x + 9}{4 \cdot x^3 + 6 \cdot x + 6}$$

$$4. \quad y = \frac{-3 \cdot x^3 - 5 \cdot x^2 - 6 \cdot x}{-4 \cdot x - 4}$$

$$5. \quad y = \frac{8 \cdot x - 4}{-7 \cdot x^2 - 5 \cdot x + 4}$$

$$6. \quad y = \frac{-5 \cdot x^2 + 4 \cdot x - 2}{2 \cdot x + 7}$$

$$7. \quad y = \frac{8 \cdot x + 5}{-2 \cdot x^3 - 3 \cdot x^2 + 8}$$

$$8. \quad y = \frac{-5 \cdot x^3 + 6 \cdot x^2 + 2}{7 \cdot x - 9}$$

$$9. \quad y = \frac{-5 \cdot x + 2}{7 \cdot x^2 + 8 \cdot x - 7}$$

$$10. \quad y = \frac{-4 \cdot x^2 + 3 \cdot x - 9}{x + 2}$$

Quotient Rule

Answer Key

Differentiate each quotient. Keep the original denominator restriction.

1. $y = \frac{6 \cdot x + 4}{-1 \cdot x^2 + 2 \cdot x + 5}$
 $dy/dx = \frac{6 \cdot x^2 + 8 \cdot x + 22}{(-1 \cdot x^2 + 2 \cdot x + 5)^2}$
 Restriction: $-x^2 + 2x + 5 \neq 0$

2. $y = \frac{6 \cdot x^2 + 7 \cdot x + 8}{-5 \cdot x - 6}$
 $dy/dx = \frac{-30 \cdot x^2 - 72 \cdot x - 2}{(-5 \cdot x - 6)^2}$
 Restriction: $-5x - 6 \neq 0$

3. $y = \frac{5 \cdot x + 9}{4 \cdot x^3 + 6 \cdot x + 6}$
 $dy/dx = \frac{-40 \cdot x^3 - 108 \cdot x^2 - 24}{(4 \cdot x^3 + 6 \cdot x + 6)^2}$
 Restriction: $4x^3 + 6x + 6 \neq 0$

4. $y = \frac{-3 \cdot x^3 - 5 \cdot x^2 - 6 \cdot x}{-4 \cdot x - 4}$
 $dy/dx = \frac{24 \cdot x^3 + 56 \cdot x^2 + 40 \cdot x + 24}{(-4 \cdot x - 4)^2}$
 Restriction: $-4x - 4 \neq 0$

5. $y = \frac{8 \cdot x - 4}{-7 \cdot x^2 - 5 \cdot x + 4}$
 $dy/dx = \frac{56 \cdot x^2 - 56 \cdot x + 12}{(-7 \cdot x^2 - 5 \cdot x + 4)^2}$
 Restriction: $-7x^2 - 5x + 4 \neq 0$

Quotient Rule

Answer Key

Differentiate each quotient. Keep the original denominator restriction.

6. $y = \frac{-5x^2 + 4x - 2}{2x + 7}$
 $dy/dx = \frac{-10x^2 - 70x + 32}{(2x + 7)^2}$
 Restriction: $2x + 7 \neq 0$

7. $y = \frac{8x + 5}{-2x^3 - 3x^2 + 8}$
 $dy/dx = \frac{32x^3 + 54x^2 + 30x + 64}{(-2x^3 - 3x^2 + 8)^2}$
 Restriction: $-2x^3 - 3x^2 + 8 \neq 0$

8. $y = \frac{-5x^3 + 6x^2 + 2}{7x - 9}$
 $dy/dx = \frac{-70x^3 + 177x^2 - 108x - 14}{(7x - 9)^2}$
 Restriction: $7x - 9 \neq 0$

9. $y = \frac{-5x + 2}{7x^2 + 8x - 7}$
 $dy/dx = \frac{35x^2 - 28x + 19}{(7x^2 + 8x - 7)^2}$
 Restriction: $7x^2 + 8x - 7 \neq 0$

10. $y = \frac{-4x^2 + 3x - 9}{x + 2}$
 $dy/dx = \frac{-4x^2 - 16x + 15}{(x + 2)^2}$
 Restriction: $x + 2 \neq 0$