

Multiplying and Dividing Rational Expressions

1. State the domain of each rational expression:

$$\frac{3x-1}{x^2-6x-40}$$

2. State the domain of each rational expression:

$$\frac{x^2+3x-5}{5x^2-12x+7}$$

3. State the domain of each rational expression:

$$\frac{x-3}{x^2+9}$$

4. Simplify each rational expression:

$$\frac{a^2-10a+16}{a-2}$$

5. Simplify each rational expression:

$$\frac{w^2-5w-50}{w^2-2w-35}$$

6. Simplify each rational expression:

$$\frac{9 - k^2}{k^2 + 11k + 24}$$

7. Simplify each rational expression:

$$\frac{v^3 - 7v^2 - 3v + 21}{v^2 - 14v + 49}$$

8. Multiply and simplify each rational expression:

$$\frac{3x^7}{x+8} \cdot \frac{x^2 + 12x + 32}{12x^2}$$

9. Multiply and simplify each rational expression:

$$\frac{5x^2 + 8x - 21}{x^2 - 6x - 27} \cdot \frac{x^2 + 4x - 32}{5x^2 - 27x + 28}$$

10. Multiply and simplify each rational expression:

$$\frac{2y^2 - 13y + 15}{4y^2 - 8y + 3} \cdot \frac{6y^2 + y - 2}{5 - y}$$

11. Multiply and simplify each rational expression:

$$\frac{p^2 - 9p + 14}{p^2 - 12p + 35} \cdot (p - 5)$$

12. Divide each rational expression.
Simplify the quotient, if possible:

$$\frac{\frac{x^2 - 14x + 48}{2x^2 - 7x + 5}}{\frac{x^2 - 64}{x^2 + 7x - 8}}$$