Simplify the rational expression, if possible.

1. \( \frac{3x - 3}{6} \)

2. \( \frac{(x + 7)(x + 9)}{(x - 9)(x + 7)} \)

3. \( \frac{x + 2}{x^2 - 4x + 4} \)

4. \( \frac{x^2 + 4x - 5}{x^2 - 25} \)

5. \( \frac{x^2 + 4x}{x^2 - 24} \)

6. \( \frac{x^2 + 10x - 11}{x^2 + 7x - 8} \)

Multiply the expressions. Simplify the result.

7. \( \frac{6x^3y}{xy^2} \cdot \frac{3x^2y}{8x^3} \)

8. \( \frac{44x^7y^4}{5xy^2} \cdot \frac{12y^5}{22x^5y^3} \)

9. \( \frac{5x(x - 2)}{(x + 1)(x - 6)} \cdot \frac{(x + 1)}{10(x - 2)(x - 1)} \)

10. \( \frac{x^2 + 4x + 3}{x^2 + 5x + 6} \cdot \frac{x^2 - 3x - 10}{x^2 + x} \)

11. \( \frac{x^2 - 9x + 20}{x^2 + 9x + 14} \cdot \frac{x^2 + 6x + 8}{x^2 - x - 20} \)

12. \( \frac{x^3 - 9x}{x^2 + 6x + 9} \cdot \frac{x^3 + 3x^2}{x - 3} \)

Divide the expressions. Simplify the result.

13. \( \frac{10x^4}{3xy^2} \div \frac{6x^2y}{xy^4} \)

14. \( \frac{16x^2y}{81xy^2} \div \frac{24x^2y}{54x^3y^3} \)

15. \( \frac{2x^2 + 4x}{x^2 - 4} \div \frac{x^2 - 3x + 2}{3x - 6} \)

16. \( \frac{9x^2}{6x - 3} \div \frac{3x^2 - 12x}{2x^2 - x} \)

17. \( \frac{(x^2 + 9x + 18)}{x^2 - 4} \div \frac{x^2 - 3x - 18}{x^2 - 9x + 18} \)

18. \( \frac{3x^2 + 4x + 1}{x^2 - 4} \div \frac{x + 1}{x^2 + 8x + 12} \)

19. **Geometry** In the diagrams below, the length of the edge of the square is twice as long as the radius of the circle. Find the ratio of the area of the circle to the area of the square. Write your answer in simplified form.

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In the diagrams below, the length of the edge of the square is twice as long as the radius of the circle. Find the ratio of the area of the circle to the area of the square. Write your answer in simplified form.