Assignment

1. Explain how to multiply the rational expressions.

$$\frac{x-3}{2} \cdot \frac{x^2-3x+4}{x^2-2x}$$

Find the products and any excluded values.

2. $\frac{x}{3x-6} \cdot \frac{x-2}{x+9}$

3. $\frac{5x^2+25x}{2} \cdot \frac{4x}{x+5}$

4. $\frac{x^2-2x-15}{10x+30} \cdot \frac{3}{x^2-3x-10}$

5. $\frac{x^2-1}{x^2+5x+4} \cdot \frac{x^2}{x^2-x}$

6. $\frac{x^2+14x+33}{4x} \cdot \frac{x^2-3x}{x+3} \cdot \frac{8x-56}{x^2+4x-77}$

7. $\frac{9x^2}{x-6} \cdot \frac{x^2-36}{3x-6} \cdot \frac{3}{4x^2+24x}$

Find the quotients and any excluded values.

8. $\frac{5x^2+10x}{x^2+2x+1} \div \frac{20x+40}{x^2-1}$

9. $\frac{x^2-9x+18}{x^2+9x+18} \div \frac{x^2-36}{x^2-9}$

10. $\frac{-x^2+x+20}{5x^2-25x} \div \frac{x+4}{2x-14}$

11. $\frac{x+3}{x^2+8x+15} \div \frac{x^2-25}{x-5}$

12. $\dfrac{x^2 - 10x + 9}{3x} \div \dfrac{x^2 - 7x - 18}{x^2 + 2x}$

13. $\dfrac{8x + 32}{x^2 + 8x + 16} \div \dfrac{x^2 - 6x}{x^2 - 2x - 24}$

Let $p(x) = \frac{1}{x+1}$ and $q(x) = \frac{1}{x-1}$. Find the result and determine whether the result of performing each operation is another rational expression.

14. $p(x) + q(x)$

15. $p(x) - q(x)$

16. $p(x) \cdot q(x)$

17. $p(x) \div q(x)$

21. Explain the Error Maria finds an expression equivalent to $\dfrac{x^2 - 4x - 45}{3x - 15} \div \dfrac{6x^2 - 150}{x^2 - 5x}$. Her work is shown. Find and correct Maria's mistake.

$$\frac{x^2 - 4x - 45}{3x - 15} \div \frac{6x^2 - 150}{x^2 - 5x} = \frac{(x - 9)(x + 5)}{3(x - 5)} \div \frac{6(x + 5)(x - 5)}{x(x - 5)}$$

$$= \frac{6(x - 9)(x + 5)(x + 5)(x - 5)}{3x(x - 5)(x - 5)}$$

$$= \frac{2(x - 9)(x + 5)^2}{x(x - 5)}$$