

Name: _____

Date: _____

Part 1: Simplify completely. Identify any values that are undefined.

1. $\frac{16x^{11}}{8x^2}$

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

3. $\frac{4x - x^2}{x^2 - 2x - 8}$

4. $\frac{6x^2 + 7x + 2}{6x^2 - 5x - 6}$

Part 2: Multiply the rational expression

5. $\frac{x^2 - 16}{x + 5} \cdot \frac{2x + 10}{x - 4}$

6. $\frac{x^2 + 9x + 18}{4 - x^2} \cdot \frac{2 - x}{x^2 + 6x}$

7. $\frac{x^3 - x}{2x^2 + 12x} \cdot \frac{x - 3}{x^2 - 4x + 3}$

Part 3: Divide the rational expression

8. $\frac{4x^3}{9x^2y} \div \frac{16}{9y^5}$

9. $\frac{8m^2}{4m + 16} \div \frac{2m^2 + 6m}{m + 3}$

10. $\frac{x^2 - 4}{x^2 - x - 6} \div \frac{2x - 4}{9 - 3x}$

Part 4: Add the rational expression. Identify any values that are undefined.

11. $\frac{x - 3}{x + 4} + \frac{x - 2}{x + 4}$

12. $\frac{4}{x - 2} + \frac{2x}{x^2 - 4}$

13. $\frac{x + 4}{x^2 - x - 12} + \frac{2x}{x - 4}$

Part 5: Subtract the rational expression. Identify any values that are undefined.

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

15. $\frac{4}{x + 4} - \frac{3}{x - 1}$

16. $\frac{x + 6}{x^2 - 7x - 18} - \frac{2x}{x - 9}$

Part 6: Complex Fractions

17. $\frac{\frac{20}{x - 1}}{\frac{6}{3x - 3}}$

18. $\frac{\frac{x + 3}{6}}{1 + \frac{x}{3}}$

19. $\frac{\frac{x}{2} - 4}{9 + \frac{2}{x}}$

Part 7: Solving. Look for extraneous solutions.

20. $\frac{4}{x} + 3 = \frac{x + 4}{2}$

21. $\frac{2}{x - 6} = \frac{-5}{x + 1}$

22. $\frac{x}{x - 1} = \frac{2x + 10}{x + 11}$

23. $\frac{5x}{x - 2} = 7 + \frac{10}{x - 2}$
