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

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

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

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

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

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

Part 6: Complex Fractions

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

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

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

Part 7: Rational Exponents

20. $\dfrac{3xy}{12x^{\frac{1}{2}}y^{\frac{-1}{3}}}$

21. $\sqrt[5]{486a^{12}b^3c^{25}}$

22. $\sqrt[3]{\dfrac{a}{2c}}$

23. $2x\sqrt[3]{81x^4y^5}+y\sqrt[3]{192x^7y^2}$

Part 8: Solving Radicals

24. $\frac{1}{2}(x-4)^{\frac{3}{2}}=3$

25. $\sqrt[4]{2x}-13=-9$

26. $2\sqrt[3]{10-3x}=\sqrt[3]{2-x}$

27. $\sqrt{4x}=x-8$