Name _____ Class _____ Date _____

Practice 9-4

Rational Expressions

Simplify each rational expression. State any restrictions on the variable.

1. $\frac{20 + 40x}{20x}$
2. $\frac{4x + 6}{2x + 3}$
3. $\frac{3y^2 - 3}{y^2 - 1}$
4. $\frac{4x + 20}{3x + 15}$
5. $\frac{x^2 + x}{x^2 + 2x}$
6. $\frac{3x + 6}{5x + 10}$
7. $\frac{2y}{y^2 + 6y}$
8. $\frac{x^2 - 5x}{x^2 - 25}$
9. $\frac{x^2 + 3x - 18}{x^2 - 36}$
10. $\frac{x^2 + 13x + 40}{x^2 - 2x - 35}$
11. $\frac{3x^2 - 12}{x^2 - x - 6}$
12. $\frac{4x^2 - 36}{x^2 + 10x + 21}$
13. $\frac{2x^2 + 11x + 5}{3x^2 + 17x + 10}$
14. $\frac{6x^2 + 5x - 6}{3x^2 - 5x + 2}$
15. $\frac{7x - 28}{x^2 - 16}$
16. $\frac{x^2 - 9}{2x + 6}$

Multiply or divide. Write the answer in simplest form. State any restrictions on the variables.

17. $\frac{5a}{5a + 5} \cdot \frac{10a + 10}{a}$
18. $\frac{9 - x^2}{5x^3 + 17x^2 + 6x} \cdot \frac{5x^2 + 2x}{x - 3}$
19. $\frac{(x - 1)(2x - 4)}{x + 4} \cdot \frac{(x + 1)(x + 4)}{2x - 4}$
20. $\frac{(x + 3)(x + 4)}{(x + 1)(x + 3)} \cdot \frac{(x + 3)(x + 1)}{x + 4}$
21. $\frac{5y - 20}{3y + 15} \cdot \frac{7y + 35}{10y + 40}$
22. $\frac{3x^3}{x^2 - 25} \cdot \frac{x^2 + 6x + 5}{x^2}$
23. $\frac{3y + 3}{6y + 12} \div \frac{18}{5y + 5}$
24. $\frac{6x + 6}{7} \div \frac{4x + 4}{x - 2}$
25. $\frac{y^2 - 2y}{y^2 + 7y - 18} \cdot \frac{y^2 - 81}{y^2 - 11y + 18}$
26. $\frac{(y + 6)^2}{y^2 - 36} \cdot \frac{3y - 18}{2y + 12}$
27. $\frac{y^2 - 49}{(y - 7)^2} \div \frac{5y + 35}{y^2 - 7y}$
28. $\frac{x^2 - 3x - 10}{2x^2 - 11x + 5} \div \frac{x^2 - 5x + 6}{2x^2 - 7x + 3}$
29. $\frac{x^2 - 5x + 4}{x^2 - 1} \cdot \frac{x^2 + 5x + 4}{x^2 - 9}$
30. $\frac{x^2 - 5x}{x^2 + 3x} \cdot \frac{x + 3}{x - 5}$
31. $\frac{x^2 - 4}{x^2 + 6x + 9} \cdot \frac{x^2 - 9}{x^2 + 4x + 4}$
32. $\frac{x^2 - 6x}{x^2 - 36} \cdot \frac{x + 6}{x^2}$
33. $\frac{x^2 + 10x + 16}{x^2 - 6x - 16} \div \frac{x + 8}{x^2 - 64}$
34. $\frac{5y}{2x^2} \div \frac{5y^2}{8x^2}$
35. $\frac{6x^2 - 32x + 10}{3x^2 - 15x} \div \frac{3x^2 + 11x - 4}{2x^2 - 32}$
36. $\frac{7x^4}{24y^5} \div \frac{21x}{12y^4}$
37. $\frac{2x + 4}{10x} \cdot \frac{15x^2}{x + 2}$
38. $\frac{x^2 + 6x}{3x^2 + 6x - 24} \cdot \frac{x^2 + 2x - 8}{x + 6}$
39. $\frac{x^2 - 5x + 4}{x^2 + 3x - 28} \cdot \frac{x^2 + 2x - 3}{x^2 + 10x + 21}$
40. $\frac{x^2 + 2x + 1}{x^2 - 1} \cdot \frac{x^2 + 3x + 2}{x^2 + 4x + 4}$