Name: Key Date: Per:

10.3 Multiplying and Dividing Rational Functions

Simplify the rational expression, if possible.

1. $\frac{3x-3}{6}$ $\frac{x-1}{2}$

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

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

4. $\frac{x^2+4x-5}{x^2-25} = \frac{(x-1)}{(x-5)}$

5. $\frac{x^2+4x}{x^2-2x-24} = \frac{x}{x-6}$

6. $\frac{x^2+10x-11}{x^2+7x-8} = \frac{x+11}{x+8}$

Multiply the expressions. Simplify the result.

7. $\frac{6x^3y}{xy^2} \cdot \frac{3x^2y}{8x^3}$ $\frac{9x}{4}$

8. $\frac{44x^7y^4}{5xy^2} \cdot \frac{12xy^5}{22x^5y^3} = \frac{24x^2y^4}{5}$

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

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

11. $\frac{x^2-9x+20}{x^2+9x+14} \cdot \frac{x^2+6x+8}{x^2-x-20} = \frac{x-4}{x+7}$

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

Divide the expressions. Simplify the result.

13. $\frac{10x^4}{3xy^2} \div \frac{6x^2y}{xy^4} = \frac{5x^2y}{9}$

14. $\frac{16x^2y}{81xy^2} \div \frac{24x^2y}{54x^3y^3} = \frac{4xy^2}{9}$

15. $\frac{2x^2+4x}{x^2-4} \div \frac{x^2-3x+2}{3x-6} = \frac{6x}{(x-2)(x-1)}$

16. $\frac{9x^2}{6x-3} \div \frac{3x^2-12x}{2x^2-x} = \frac{x^2}{x-4}$

17. $(x^2+9x+18) \div \frac{x^2-3x-18}{x^2-9x+18}$
$= (x+6)(x-3)$

18. $\frac{3x^2+4x+1}{x^2-4} \div \frac{x+1}{x^2+8x+12}$
$= \frac{(3x+1)(x+6)}{(x-2)}$

Simplify the following expressions either by multiplying or dividing!

19) $\frac{10m^2 - 54m + 56}{5m - 7} \cdot \frac{m^2 - 7m + 10}{4m^3 - 16m^2} =$ $\frac{(m-5)(m-2)}{2m^2}$

20) $\frac{2x^2 - 6x - 36}{10x^2 + 42x + 36} \cdot \frac{5x^2 - 19x - 30}{8} =$ $\frac{(x-6)(x-5)}{8}$

21) $\frac{5x^2 - 13x + 8}{5x^2 - 38x + 48} \div \frac{3x^2 + 19x + 30}{3x + 10} =$ $\frac{(x-1)}{(x-6)(x+3)}$

22) $\frac{27x^2 - 72x}{6x^2 - 25x + 24} \div \frac{28x^2 - 4x}{14x^2 - 23x + 3} =$ $\frac{9}{4}$