

Unit 4 Day 01 HW: Multiplying & Dividing Rational Expressions Name Master G

REMEMBER: FACTORING IS THE KEY!

Date \_\_\_\_\_ Block \_\_\_\_\_

1-6: Simplify each expression fully.

1.  $\frac{6x^3 + 18x^2}{4x^3 - 36x} = \frac{6x^2(x+3)}{4x(x^2-9)}$   
 $\frac{6x^2(x+3)}{4x(x+3)(x-3)}$   
 $\frac{3x}{2(x-3)}$

2.  $\frac{4x^2 + 36x + 80}{2x + 8} = \frac{4(x^2 + 9x + 20)}{2(x+4)}$   
 $\frac{4(x+4)(x+5)}{2(x+4)}$   
 $2(x+5)$

3.  $\frac{2x^2 - 10x + 12}{x^2 + 2x - 15} = \frac{2(x^2 - 5x + 6)}{(x+5)(x-3)}$   
 $\frac{2(x-3)(x-2)}{(x+5)(x-3)}$   
 $\frac{2(x-2)}{x+5}$

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

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

6.  $\frac{25 - v^2}{3v^2 - 13v - 10} = \frac{(5+v)(5-v)}{(3v+2)(v+5)} \cdot -1$   
 $\frac{-(5+v)}{3v+2} = \frac{-v-5}{3v+2}$

7-18: Multiply or divide each expression. Simplify completely.

7.  $\frac{12x^3}{25} \cdot \frac{40}{9x^2} = \frac{2 \cdot 2 \cdot \cancel{3} \cdot x \cdot x \cdot x \cdot 2 \cdot 2 \cdot 2 \cdot \cancel{5}}{\cancel{5} \cdot 5 \cdot \cancel{3} \cdot \cancel{3} \cdot x \cdot x}$   
 $\frac{32x}{15}$

8.  $\frac{6}{x^2 - 9x + 20} \cdot \frac{5x^3 - 625}{15} = \frac{6}{(x-5)(x-4)} \cdot \frac{5(x^3 - 125)}{15}$   
 $\frac{2 \cdot \cancel{3} \cdot 5(x-5)(x^2 + 5x + 25)}{(x-5)(x-4)(\cancel{5} \cdot \cancel{3})}$   
 $\frac{2(x^2 + 5x + 25)}{(x-4)}$

9.  $\frac{9 - a^2}{a^2 + 5a + 6} \div \frac{2a - 6}{5a + 10} = \frac{(3+a)(3-a) \cdot 5(a+2)}{(a+3)(a+2) \cdot 2(a-3)}$   
 $\frac{-5(3+a)}{2(a+3)} = \frac{-5}{2}$

10.  $\frac{5n+15}{8-4n} \cdot \frac{2n-4}{3n+9} = \frac{5(n+3) \cdot 2(n-2)}{4(2-n) \cdot 3(n+3)} = \frac{-5}{6}$

$$11. \frac{n^5}{4n-24} \cdot \frac{n^3-6n^2}{n^8} = \frac{n^7}{4n^8} = \frac{1}{4n}$$

$$12. \frac{m^2-2m-8}{8m+24} \div \frac{2m-8}{m^2+7m+12}$$

$$\frac{(m-4)(m+2)}{8(m+3)} \cdot \frac{(m+4)(m+3)}{2(m-4)}$$

$$\frac{(m+2)(m+4)}{16}$$

$$13. \frac{16x^2+40x+25}{3x^2-10x-8} \div \frac{4x+5}{x^2-8x+16}$$

$$\frac{(4x+5)(4x+5)}{(3x+2)(x-4)} \cdot \frac{(x-4)(x-4)}{(4x+5)}$$

$$\frac{(4x+5)(x-4)}{(3x+2)}$$

$$14. \frac{6}{x^2+9x+20} \cdot \frac{8x^2-128}{6x-24}$$

$$\frac{6}{(x+4)(x+5)} \cdot \frac{8(x^2-16)}{6(x-4)}$$

$$\frac{6}{(x+4)(x+5)} \cdot \frac{8(x+4)(x-4)}{6(x-4)} = \frac{8}{x+5}$$

$$15. \frac{2x^2-7x-15}{x^2-16} \div \frac{x^2-10x+25}{x+4}$$

$$\frac{(2x+3)(x-5)}{(x-4)(x+4)} \cdot \frac{(x+4)}{(x-5)(x-5)}$$

$$\frac{2x+3}{(x-4)(x-5)}$$

$$16. \frac{6x-30}{x^2-7x+10} \cdot \frac{7x-14}{6x} \div \frac{2x^2}{x^5}$$

$$\frac{6(x-5)}{(x-5)(x-2)} \cdot \frac{7(x-2)}{6 \cdot x} \cdot \frac{x^5}{2x^2}$$

$$\frac{7x^5}{2x^3} = \frac{7x^2}{2}$$

$$17. \frac{a^2-b^2}{\frac{4a}{a+b}} \cdot \frac{(a+b)(a-b)}{2a} = \frac{a-b}{2}$$

$$18. \frac{x^3+8}{x^2-2x} \cdot \frac{(x+2)(x^2-2x+4)}{x(x-2)}$$

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

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