

Accelerated 65 - 95 HW 30 (R 4.2) Multiplication and Division of Rational Expressions

Name: \_\_\_\_\_

**Review of Fractions:**

11.  $\frac{1}{2} \cdot \frac{4}{5}$

15.  $\frac{3}{8} \cdot 2$

19.  $\frac{5}{7} \div \frac{15}{14}$

13.  $\frac{7}{8} \cdot \frac{4}{3} \cdot (-3)$

17.  $-\frac{7}{11} \div 14$

21.  $6 \div \left(-\frac{1}{3}\right)$

**Simplifying Rational Expressions:**

In exercises 23 - 51, simplify the rational expression. State any domain restriction necessary so that the expressions truly are equivalent.

23.  $\frac{5x}{x^2}$

29.  $\frac{(x-1)(x+1)}{x-1}$

25.  $\frac{3z+6}{z+2}$

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

$$35. \frac{(3x+1)(x+2)}{(x+2)(5x-2)}$$

$$47. -\frac{4-t}{t-4}$$

$$39. \frac{x^2+2x}{x^2+3x+2}$$

$$51. \frac{5-y}{y-5}$$

In exercises 61 - 103, multiply or divide as appropriate. Leave your answer in factored form when appropriate. State any domain restriction necessary so that the expressions truly are equivalent.

$$61. \frac{2}{x} \cdot \frac{x-1}{3x}$$

$$63. \frac{x-2}{x} \cdot \frac{x-3}{x+4}$$

$$65. \frac{1}{2x} \cdot \frac{4x}{2}$$

$$73. \frac{b^2 + 1}{b^2 - 1} \cdot \frac{b - 1}{b + 1}$$

$$67. \frac{5a}{4} \cdot \frac{12}{5a}$$

$$75. \frac{x^2 - 2x - 35}{2x^3 - 3x^2} \cdot \frac{x^3 - x^2}{2x - 14}$$

$$69. \frac{9x^2y^4}{8xy^6} \cdot \frac{(2xy^2)^3}{3(xy)^4}$$

$$79. \frac{3n - 9}{n^2 - 9} \cdot \frac{n^3 + 27}{12}$$

$$83. \frac{x-1}{y} \cdot \frac{y(x+y)}{2} \cdot \frac{y}{x+y}$$

$$95. \frac{x+5}{x-x^3} \div \frac{25-x^2}{x^3}$$

$$87. \frac{8a^4}{3b} \div \frac{a^5}{9b^2}$$

$$99. \frac{x^2-4}{x^2+x-2} \div \frac{x-2}{x-1}$$

$$91. \frac{6b}{b+2} \div \frac{3b^4}{2b+4}$$

$$103. \frac{x-3}{x-1} \div \frac{x^2}{x-1} \div \frac{x-3}{x}$$



### Supplemental Problems:

S1. Simplify the expressions for the following rational functions. State any domain restriction necessary so that the expression truly are equivalent.

$$(a) f(x) = \frac{2x^2 + 6x}{3x + 9}$$

$$(d) L(x) = \frac{x^3 - 4x^2 - 5x}{2x^2 - 13x + 15}$$

$$(b) T(x) = \frac{x^2 + 6x + 9}{x^2 - 9}$$

$$(e) d(x) = \frac{x^2 - 16}{12 - 3x}$$

$$(c) g(x) = \frac{2x^2 - x - 6}{x^2 + x - 6}$$

$$(f) A(x) = \frac{12x^2 - 23x + 10}{12x^2 - 23x + 10}$$

## Solutions to Supplemental Problems:

S1.

a.  $f(x) = \frac{2x}{3}$ ,  $D = \{x|x \neq -3\}$

d.  $L(x) = \frac{x(x+1)}{2x-3}$ ,  $D = \{x|x \neq 5\}$

b.  $T(x) = \frac{x+3}{x-3}$ ,  $D = \{x|x \neq -3\}$

e.  $d(x) = -\frac{x+4}{3}$ ,  $D = \{x|x \neq 4\}$

c.  $g(x) = \frac{2x+3}{x+3}$ ,  $D = \{x|x \neq 2\}$

f.  $A(x) = 1$ ,  $D = \left\{x|x \neq \frac{5}{4}, x \neq \frac{2}{3}\right\}$