

Name _____ Date: _____ Block: _____

1. Determine the restriction(s) on the following rational expressions.

a. $\frac{5}{x}$

b. $\frac{x+5}{x-3}$

c. $\frac{x-2}{x^2+2}$

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

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

f. $\frac{x^2-3x-4}{x^2-2x}$

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

h. $\frac{x^2+y^2}{x^2-y^2}$

2. Simplify the following rational expressions. Assume no denominators are zero.

a. $\frac{x-3}{x-3}$

b. $\frac{x-1}{1-x}$

c. $\frac{x+1}{1+x}$

d. $\frac{-x-3}{x+3}$

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

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

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

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

i. $\frac{x^2-1}{1-x^2}$

j. $\frac{3(x-5)(x-7)(x+1)}{7(5-x)(1+x)(7-x)}$

3. Reduce to lowest terms. Assume no denominators are zero.

a. $\frac{3m}{3m-6}$

b. $\frac{5xy}{5x^2+10xy}$

c. $\frac{6x^2y}{12x^2y+9xy^2}$

d. $\frac{14x^2y}{21x^2y - 35xy^2}$

e. $\frac{4x+8}{2x+4}$

f. $\frac{2x-10}{3x-15}$

g. $\frac{3n-12m}{20m-5n}$

h. $\frac{3a+12}{6a+24}$

i. $\frac{2x^2+6x}{5x}$

j. $\frac{2x^2-10x}{4x-20}$

k. $\frac{9-3x}{x^2-3x}$

l. $\frac{x^2+7x+12}{x+4}$

m. $\frac{x^2-10x+25}{5-x}$

n. $\frac{x^2+x-6}{2-x}$

4. Reduce to lowest terms. Assume no denominators are zero.

a. $\frac{4ab}{8ac}$

b. $\frac{-18x^2y}{3xy^2}$

c. $\frac{-8x^2yz}{-24xyz^2}$

d. $\frac{-25a^3b^2c}{40ab^7}$

5. Simplify. Assume no denominators are zero.

a. $\frac{a^2+7a+10}{a^2+5a+6}$

b. $\frac{x^2-16}{x^2+4x-32}$

c. $\frac{r^2+7r+12}{r^2+3r-4}$

d. $\frac{x^2+8xy+12y^2}{x^2+2xy-24y^2}$

Answers:

1a. $x \neq 0$ b. $x \neq 3$ c. no restrictions. d. $x \neq -5, 1$ e. $x \neq 0, 0.5$ f. $x \neq 0, 2$ g. $x \neq 2, 3$ h. $x \neq -y, y$

2a. 1 b. -1 c. 1 d. -1 e. $\frac{x-4}{4}$ f. $\frac{x-1}{x+1}$ g. $\frac{x+4}{-(x-2)}$ h. $x-1$ i. -1 j. $\frac{3}{7}$

3a. $\frac{m}{m-2}$ b. $\frac{y}{x+2y}$ c. $\frac{2x}{4x+3y}$ d. $\frac{2x}{3x-5y}$ e. 2 f. $\frac{2}{3}$ g. $\frac{3}{5}$ h. $\frac{1}{2}$ i. $\frac{2x+6}{5}$

3j. $\frac{x}{2}$ k. $-\frac{3}{x}$ l. $x+3$ 3m. $-x+5$ n. $-x-3$ or $-(x+3)$

4a. $\frac{b}{2c}$ b. $\frac{6x}{y}$ c. $\frac{x}{3z}$ d. $-\frac{5a^2c}{8b^5}$ 5a. $\frac{a+5}{a+3}$ b. $\frac{x+4}{x+8}$ c. $\frac{r+3}{r-1}$ d. $\frac{x+2y}{x-4y}$