

**Math 20**  
**Review of Rational Expressions**

What is a rational expression?

Find the non-permissible values of each rational expression:

a)  $\frac{12}{x+5}$

b)  $\frac{x+2}{x^2-49}$

c)  $\frac{x^2-x-12}{5x^2-2x-3}$

Reduce/simplify the following rational expressions:

a)  $\frac{12x^3y^2}{28x^2y^4}$

b)  $\frac{x^2-5x+6}{x^2-9}$

c) 
$$\frac{6x^3 + 7x^2 - 20x}{2x^3 + 5x^2}$$

d) 
$$\frac{x-2}{2-x}$$

Simplify the following completely:

a) 
$$\frac{9}{9x+3} \cdot \frac{3x+1}{6}$$

b) 
$$\frac{3x^4 - 12x^3}{x^2 - 5x + 4} \cdot \frac{x^2 - 1}{6x^2}$$

c) 
$$\frac{2x^2 - 3x - 2}{6x^3 + 12x^2} \div \frac{2x^2 - 5x + 2}{10x^2 + 20x}$$

Simplify (write as one rational expression in simplest form):

a)  $\frac{2f-5}{f^2-4} - \frac{f-3}{f^2-4}$

b)  $\frac{3a+6}{4} - \frac{2a-5}{6}$

c)  $\frac{5}{2a^3} - \frac{1}{a^4} + 4$

**Answers:**

1. A rational expression is a ratio of two polynomials.

2.

a.  $x \neq -5$

b.  $x \neq 7, x \neq -7$

c.  $x \neq -\frac{3}{5}, x \neq 1$

3.

a.  $\frac{3x}{7y^2}$

b.  $\frac{x-2}{x+3}$

c.  $\frac{3x-4}{x}$

d.  $-1$  (opposites)

4.

a.  $\frac{1}{2}$

b.  $\frac{x(x+1)}{2}$

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

5.

a.  $\frac{1}{f+2}$

b.  $\frac{5a+28}{12}$

c.  $\frac{8a^4+5a-2}{2a^4}$