Unit 6 Review: Rational Expressions and Equations

1. Simplify and find any non-permissible values. Show all work.

a) $\frac{8x^2y^3}{12y^2}$

b) $\frac{(x-7)(x+4)}{(x+4)(x+7)}$

c) $\frac{m^2+5m-6}{m^2+6m}$

d) $\frac{t^2-81}{18t-2t^2}$

e) $\frac{35ab^2c^5}{-91a^3bc}$

2. Write each product or quotient in simplest form. Identify all non-permissible values.

a) $\frac{5x^2}{x-3} \times \frac{x-3}{10x}$

b) $\frac{2m-8}{m+3} \times \frac{m^2+4m+3}{m-4}$

c) $\frac{m^2-11m+28}{54-6m} \div \frac{3m-21}{m-9}$

d) $\frac{2x^2+3x-2}{x^2+3x-18} \div \frac{6x^2-x-1}{x^2-4x+3}$

e) $\frac{\frac{4a^2-10}{a-3}}{\frac{6a^2-15}{2a^2-18}}$

f) $\frac{n-9}{n+5} \times \frac{n^2+14n+45}{2n-18}$

3. Add or subtract. Express answers in simplest form. Identify all non-permissible values.

a) $\frac{x^2+1}{x-8} + \frac{2x+1}{x-8}$

b) $\frac{4n-8}{n^2} - \frac{n+1}{n^2}$

c) $\frac{6a-19}{a^2-3a-4} + \frac{a-5}{a-4}$

d) $\frac{2x+4}{x^2+8x+1} - \frac{x+1}{x^2-1}$

e) $\frac{7}{2x^2+x-3} + \frac{8}{x+1} - \frac{9}{2x+3}$

4. Solve and verify each rational equation. Identify all non-permissible values. Verify your solutions.

a) $\frac{x}{3} + \frac{3}{x} = 2$

b) $\frac{x-24}{x^2-8x} - \frac{5-x}{x-8} = \frac{2x+3}{x}$

c) $\frac{x+3}{x} - \frac{x^2-8x+1}{x^2+x} = 2$

d) $\frac{1}{x-2} = \frac{2}{x^2-4} + \frac{10}{6x+12}$

e) $1 + \frac{1}{x-3} = \frac{2x^2+2x-1}{x^2-9x+18}$

5. The sum of the reciprocals of two even consecutive integers is $\frac{29}{420}$. Find the integers.

6. The speed of a river's current is 5 km/hr. A boat travelled 10 km upstream and 10 km downstream in a total of 6 hours. What was the speed of the boat in still water to the nearest tenth?

Additional Practice:

p. 352 #3ade, 9bcef, 10bce, 11bc, 14ce, 15, 20, 21; p.355 #13