

Rational Expressions Review

A. Reduce to simplest terms. State the restrictions for each question that has an * by it.

1. $\frac{a^2+a-2}{a^2-1}$

2. * $\frac{15+2y-y^2}{3y^2-16y+5}$

3. $\frac{x^2+9xy+20y^2}{x^2+5xy}$

4. * $\frac{9v^2-6v+1}{12v^2-13v+3}$

B. Rational Operations. Reduce final answers to simplest forms. State restrictions if *.

1. * $\frac{8}{3a} - \frac{2}{a}$

2. $\frac{4}{(x-7)(x+7)} - \frac{3}{(x-7)(x+2)}$

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

4. $\frac{6x}{x^2-8x+16} - \frac{2}{x-4}$

$$5. \frac{x^2-9}{x^2-x-12} - \frac{x^2-5x-14}{x^2-4x-21}$$

$$6. \frac{m-4}{m^2-8m+16} + \frac{3m+21}{m^2+12m+35}$$

$$7. * \frac{x^2+12x+35}{2x+1} \cdot \frac{2x^2+7x+3}{x+5}$$

$$8. \frac{2x^3-50x}{5x^2-30x+25} \cdot \frac{5x-5x^2}{x^3+5x^2}$$

$$9. * \frac{16x^2+8x+1}{x^2+6x-27} \div \frac{8x^2+22x+5}{2x^2-x-15}$$

$$10. \frac{\frac{1}{a^2-36}}{\frac{1}{a-6}}$$

C. Solving Equations. Remember to state restrictions for ALL questions.

1. $\frac{5}{2x} + 3 = \frac{9}{4x}$

2. $\frac{x+2}{x-3} = \frac{x-1}{x-2}$

3. $\frac{4x}{3x+4} - \frac{10}{x+6} = 0$

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

D. Word Problems. Set up a distance chart and a rational equation. Solve and make a concluding statement.

- 1) George has a routine where he walks for 3 km, runs for 7.5 km and then walks for an additional 4 km. He runs 2.5 times as fast as he walks. The total time taken for his routine is 2 hours. What is his walking speed, to the nearest km/h?

- 2) A plane flew from Red Deer to Winnipeg, a flying distance of 1260 km. On the return trip, due to a strong head wind, the plane travelled 1200 km in the same time it took to complete the outward journey. On the outward journey, the plane was able to maintain an average speed 20 km/h greater than on the return journey. Calculate the average speed of the plane from Winnipeg to Red Deer and the total flying time for the round trip.

Answers:

A. 1. $\frac{a+2}{a+1}$	2. $\frac{-(y+3)}{3y-1}, y \neq 5, \frac{1}{3}$	3. $\frac{x+4y}{x}$	4. $\frac{3v-1}{4v-3}, v \neq \frac{1}{3}, \frac{3}{4}$
B. 1. $\frac{2}{3a}, a \neq 0$	2. $\frac{x-13}{(x+7)(x-7)(x+2)}$	3. $\frac{2}{x-3}, x \neq 3$	4. $\frac{4x+8}{(x-4)^2}$
5. $\frac{2x-1}{(x-4)(x+3)}$	6. $\frac{4m-7}{(m-4)(m+5)}$	7. $(x+7)(x+3),$ $x \neq \frac{-1}{2}, -5$	
8. -2	9. $\frac{4x+1}{x+9},$ $x \neq -9, 3, \frac{-1}{4}, \frac{-5}{2}$	10. $\frac{1}{a+6}$	
C. 1. $x = \frac{-1}{12}$	2. $x = \frac{7}{4}$	3. $x = \frac{-5}{2}, 4$	4. No solution
D. 1. 5km/h	2. 400km/h, 6 hours and 9 minutes		