

Rational Expression Exam

1. Simplify the following:

a) $\frac{27x^4y^2}{-81x^2y^7}$

b) $\frac{15(x-2)(x+3)^2}{6(x+3)(x+2)}$

c) $\frac{9x^2 + 6xy - 3y^2}{12x^2 - 12y^2}$

d) $\frac{x^3 + 5x^2 + 6x}{x^2 - 4}$

2. Multiplication and Division

a) $\frac{4x^2z}{15y^4} * \frac{25y^6}{16x^7}$

b) $\frac{x^2 - 9}{x^2 - 6x + 9} * \frac{x^2 - 2x - 3}{(x + 3)}$

c) $\frac{(x+2)^2}{2x} \cdot \frac{x^2 - 3x}{x^2 - 5x + 6}$

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

$$\text{e) } \frac{10m^2n}{6m-9} \div \frac{25mn^2}{2m-3}$$

$$\text{f) } \frac{x^2+5x+6}{x^2-5x+6} \div \frac{x^2-x-6}{x^2+x-6}$$

$$\text{g) } \frac{3x^2+8x+4}{9x^2-4} \div \frac{2x^2+5x+2}{3x^2-5x+2}$$

$$\text{h) } \frac{10a+8-3a^2}{a^2-a-12} \cdot \frac{9a^3-81a}{3a^2-7a-6}$$

3. Addition and Subtraction

$$\text{a) } \frac{2x^2+3}{x-3} - \frac{x^2-2}{3-x}$$

$$\text{b) } \frac{1}{a-x} - \frac{3x}{a^2-x^2} - \frac{a}{ax+x^2}$$

$$\text{c) } \frac{3x^2+4}{x-5} + \frac{x^2-7}{5-x}$$

$$\text{d) } \frac{1}{2x} + \frac{5x}{x^2-1} + \frac{3}{x+1}$$

$$\text{e) } \frac{2}{x-4} + \frac{2x+3}{x^2-5x+4}$$

$$\text{f) } \frac{x+5}{x^2-5x-36} + \frac{x-6}{x^2-11x+18}$$

4. For each of the given expressions determine:

- a) the values of “x” which will make the expression equal to zero
- b) the values of “x” for which the function would be undefined

$$\text{a) } \frac{8x+12}{4x-20}$$

$$\text{b) } \frac{2d^3+4d^2-16d}{d^2+d-12}$$