Honors Algebra 2 — Unit – Rationals – Mixed Review

Name: Key Date:

Part 1: Simplify completely. Identify any values that are undefined.

1. $\frac{16x^{11}}{8x^2}$

$2x^9$ $x \neq 0$

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

$\frac{(x+2)(x-1)}{(x+3)(x-1)}$ $\frac{x+2}{x+3}$ $x \neq -3, 1$

3. $\frac{4x-x^2}{x^2-2x-8}$

$\frac{-x^2+4x}{}$ $\frac{-x(x-4)}{(x-4)(x+2)}$ $\frac{-x}{x+2}$ $x \neq 4, -2$

4. $\frac{6x^2+7x+2}{6x^2-5x-6}$ 36, $a \cdot c$

$(x-\frac{-9}{6})(x+\frac{-4}{6})$

$\frac{(3x+2)(2x+1)}{(2x-3)(3x+2)}$ $\frac{2x+1}{2x-3}$ $x \neq 3/2, -2/3$

Part 2: Multiply the rational expression

5. $\frac{x^2-16}{x+5} \cdot \frac{2x+10}{x-4}$

$\frac{(x-4)(x+4)}{x+5} \cdot \frac{2(x+5)}{x-4}$ $2(x+4)$

6. $\frac{x^2+9x+18}{4-x^2} \cdot \frac{2-x}{x^2+6x}$

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

7. $\frac{x^3-x}{2x^2+12x} \cdot \frac{x-3}{x^2-4x+3}$ $x(x^2-1)$

$\frac{x(x-1)(x+1)}{2x(x+6)} \cdot \frac{x-3}{(x-3)(x-1)}$ $\frac{x+1}{2(x+6)}$

Part 3: Divide the rational expression

8. $\frac{4x^3}{9x^2y} \div \frac{16}{9y^5}$

$\frac{4x^3}{9x^2y} \cdot \frac{9y^5}{16} = \frac{xy^4}{4}$

9. $\frac{8m^2}{4m+16} \div \frac{2m^2+6m}{m+3}$

$\frac{8m^2}{4(m+4)} \cdot \frac{m+3}{2m(m+3)}$ $\frac{m}{m+4}$

10. $\frac{x^2-4}{x^2-x-6} \div \frac{2x-4}{9-3x}$

$\frac{(x-2)(x+2)}{(x-3)(x+2)} \cdot \frac{-3(x-3)}{2(x-2)}$ $\frac{-3}{2}$

Part 4: Add the rational expression. Identify any values that are undefined.

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

$\frac{2x-5}{x+4}$ $x \neq -4$

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

LCD: $(x-2)(x+2)$

$\frac{4x+8+2x}{(x-2)(x+2)} = \frac{6x+8}{(x-2)(x+2)}$ $\frac{2(3x+4)}{(x-2)(x+2)}$ or

$x \neq 2, -2$

13. $\frac{x+4}{x^2-x-12} + \frac{2x}{x-4}$ $x+3$

$(x-4)(x+3)$

$x \neq 4, -3$

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

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

Part 5: Subtract the rational expression. Identify any values that are undefined.

14. $\frac{x^2-4}{x-4} + \frac{5x+10}{x-4}$

$\frac{x^2-5x-14}{x-4}$ or $\frac{(x-7)(x+2)}{x-4}$

$x \neq 4$

15. $\frac{4}{x+4} - \frac{3}{x-1}$ LCD: $(x+4)(x-1)$

$\frac{4x-4-3x-12}{(x+4)(x-1)}$

$\frac{x-16}{(x+4)(x-1)}$ $x \neq -4, 1$

16. $\frac{x+6}{x^2-7x-18} - \frac{2x}{x-9}$ $(x-9)(x+2)$

$\frac{x+6-2x^2-4x}{(x-9)(x+2)}$

$\frac{-2x^2-3x+6}{(x-9)(x+2)}$ $x \neq 9, -2$

Part 6: Complex Fractions

17. $\frac{\frac{20}{x-1}}{\frac{6}{3x-3}}$

$\frac{20}{x-1} \cdot \frac{3(x-1)}{6}$

10

18. $\frac{\frac{x+3}{6}}{1+\frac{x}{3}}$

$\frac{3+x}{3}$

$\frac{x+3}{6} \cdot \frac{3}{3+x} = \frac{1}{2}$

19. $\frac{\frac{x}{2}-4}{9+\frac{2}{x}} \rightarrow \frac{\frac{x-8}{2}}{\frac{9x+2}{x}}$

$\frac{x-8}{2} \cdot \frac{x}{9x+2} = \frac{x(x-8)}{2(9x+2)}$

Part 7: Solving. Look for extraneous solutions.

20. $\frac{4}{x} + 3 = \frac{x+4}{2}$ LCD: $2x$

$8 + 6x = x^2 + 4x$

$x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x = 4$

$x = -2$

$x \neq 0$

21. $\frac{2}{x-6} = \frac{-5}{x+1}$ LCD: $(x-6)(x+1)$

$2x+2 = -5x+30$

$7x = 28$

$x = 4$

$x \neq 6, -1$

22. $\frac{x}{x-1} = \frac{2x+10}{x+11}$ LCD $(x-1)(x+11)$

$x^2 + 11x = 2x^2 + 8x - 10$

$-x^2 - 11x$

$x^2 - 3x - 10 = 0$

$(x-5)(x+2) = 0$

$x = 5, x = -2$

$x \neq 1, -11$

23. $\frac{5x}{x-2} = 7 + \frac{10}{x-2}$ LCD: $x-2$

$5x = 7x - 14 + 10$

$5x = 7x - 4$

$-2x = -4$

$x = 2$

$x \neq 2$

No Solution