



Name _____ Date _____ Period _____

OPERATIONS WITH RATIONALS WORKSHEET

Rational Functions and Domain

Find the domain of each rational function.

1. $f(x) = \frac{1}{x-2}$

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

3. $h(x) = \frac{x^2+8x-20}{x^2+11x+10}$

Simplifying, Multiplying, and Dividing Rational Expressions

Simplify each rational expression.

4. $\frac{3xy}{xy+x}$

5. $\frac{4y-8y^2}{10y-5}$

6. $\frac{x-5}{10-2x}$

7. $\frac{x^3+5x^2+6x}{x^2-4}$

8. $\frac{y^2-7y+12}{y^2+3y-18}$

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

10. $\frac{z^3-8}{z^2+2z+4}$

Multiply each rational expression.

11. $\frac{5}{x-1} \cdot \frac{x-1}{25(x-2)}$

12. $\frac{r}{r-1} \cdot \frac{r^2-1}{r^2}$

13. $\frac{t^2-t-6}{t^2+6t+9} \cdot \frac{t+3}{t^2-4}$

Divide each rational expression.

14. $\frac{x^2-36}{x} \div \frac{x^3-6x^2}{x^2+x}$

15. $\frac{b^2-2b-15}{8b+20} \div \frac{2}{4b+10}$

16. $\frac{x^2-4x-21}{x^2-2x-8} \div \frac{x-7}{x^2+2x+1}$

Adding and Subtracting Rational Expressions

Perform the addition or subtraction and simplify.

$$17. \frac{5}{x-1} + \frac{x}{x-1}$$

$$18. 6 - \frac{5}{x-3}$$

$$19. \frac{3}{x-2} + \frac{5}{2-x}$$

$$20. \frac{1}{x^2-x-2} - \frac{x}{x^2-5x+6}$$

$$21. -\frac{1}{x} + \frac{2}{x^2+1} + \frac{1}{x^3+x}$$

$$22. \frac{2}{x+1} + \frac{2}{x-1} + \frac{1}{x^2-1}$$

Complex Fractions

Simplify each complex fraction.

$$23. \frac{\frac{x}{2}-1}{x-2}$$

$$24. \frac{\frac{x-4}{x}-4}{\frac{4}{x}}$$

$$25. \frac{\frac{x^2}{(x+1)^2}}{\frac{x}{(x+1)^3}}$$