

# Chapter 4 Review

*Directions: Complete the following sets of problems*

**Simplify each rational expression.**

1.  $\frac{6x^2-4x}{9x^2-12x+4}$

2.  $\frac{y-1}{y^3-1}$

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

**Multiply and simplify each rational expression.**

4.  $\frac{5y}{x^2} * \frac{x^2}{20y^2}$

5.  $\frac{y^2+2y+1}{y-1} * \frac{2y^2-2y}{y^2-1}$

6.  $\frac{y^2-5y+6}{y+5} * \frac{3y+15}{y^2-4y+4}$

7.  $\frac{3x}{4y^2} * \frac{12y}{5x^2} * \frac{15x^3}{8y}$

8.  $\frac{x-1}{x+1} * \frac{2x+2}{3x-3} * \frac{9}{4}$

**Simplify, multiply and divide each rational expression below.**

9.  $\frac{a}{b} \div \frac{c}{d} \div \frac{e}{f}$

10.  $\frac{x^2+1}{x^2-1} * \frac{x+1}{5x} \div \frac{x-1}{10x^2}$

11.  $\frac{7x^2}{5-3x} \div \frac{21}{2x+4} * \frac{2x^2}{3x-5}$

12.  $\frac{x^2-1}{3x} * \frac{x^2}{x+1} \div \frac{x^2-2x+1}{6x}$

13.  $\frac{y^2-1}{y^2+3y} \div \frac{y+1}{5y^2} * \frac{y^2+6y+9}{y-1}$

Add each rational expression below. Simplify your answers.

$$14. \quad \frac{a}{a-2} + \frac{4a}{a^2-4a+4}$$

$$15. \quad \frac{2x}{2x-1} + \frac{5x}{2x^2-7x+3}$$

$$16. \quad \frac{x^2+3x}{x^2+3x+2} + \frac{x}{x+2}$$

Subtract each rational expression below. Simplify your answers.

$$17. \quad \frac{1}{a} - \frac{2}{a^2} - \frac{3}{a^2}$$

$$18. \quad \frac{y}{y-1} + \frac{1}{y} - \frac{1}{y^2-y}$$

$$19. \quad \frac{2y}{y+1} + \frac{4}{y-1} - \frac{4}{y^2-1}$$

$$20. \quad \frac{y}{y+1} - \frac{4}{y+4} - \frac{3}{y^2+5y+4}$$

Solve for each variable in the following equations. Be sure to check any or all solutions to see if they are true for the given equation. Remember, just because you find two solutions, that does not mean they will both work.

$$21. \quad \frac{5}{y^2-9} = \frac{3}{y+3} - \frac{2}{y-3}$$

$$22. \quad \frac{x}{9} - \frac{4}{2x+3} = 1$$

$$23. \quad \frac{2x}{4x-1} + \frac{x}{4x+1} = \frac{1}{16x^2-1} + \frac{1}{2}$$

$$24. \quad \frac{3}{2m} - \frac{6}{2m+m^2} = \frac{1}{m+2}$$

$$25. \quad \frac{2}{y+2} - \frac{6}{y^2+5y+6} = \frac{5}{(y+2)^2}$$