Name _____ Date _____ Period _____

Simplify.

1. $\dfrac{3x^2}{4x^2-9y^2} - \dfrac{3y^2}{2x-3y}$

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

3. $\dfrac{5x}{(4x-1)^2} + \dfrac{2}{4x-1}$

4. $2x + \dfrac{1}{x+1}$

Solve the equation algebraically. <u>State the restrictions on #5-12</u> and identify any extraneous solutions. Show work!

5. $\dfrac{x-2}{3} + \dfrac{x+5}{3} = \dfrac{1}{3}$

6. $x + \dfrac{4x}{x-3} = \dfrac{12}{x-3}$

7. $x + \dfrac{12}{x} = 7$

8. $\dfrac{3x}{x+5} + \dfrac{1}{x-2} = \dfrac{7}{x^2+3x-10}$

9. $\dfrac{3}{x+2} + \dfrac{6}{x^2+2x} = \dfrac{3-x}{x}$

10. $\dfrac{x^2-2x+1}{x+5} = 0$

11. $2 - \dfrac{1}{x+1} = \dfrac{1}{x^2+x}$

12. $\dfrac{2}{x-1} + x = 5$ (Use Q.F.)

For # 13 and 14, First identify if you need to simplify (times top and bottom to make denominators the same) or solve (multiply entire equation by LCD). Then simplify or solve. Show your work.

13. $\dfrac{x+1}{2x-3} - \dfrac{x-1}{2x^2-5x+3} = 1$

14. $\dfrac{x+1}{2x-3} - \dfrac{x-1}{2x^2-5x+3}$

Circle the correct directions.

    Simplify or Solve

WORK:

Circle the correct directions.

    Simplify or Solve

WORK:

Solve each inequality using sign charts. Write answers in interval notation.

15. $\dfrac{x-3}{x+1} > 0$

16. $\dfrac{(x-1)(x+1)}{x} \le 0$

17. $\dfrac{(x-2)^2}{x^2-1} \ge 0$

18. $\dfrac{(x-3)(x+2)}{x-1} \le 0$

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

20. $\dfrac{5}{x-3} > \dfrac{3}{x+1}$

21. $(2x-1)\sqrt{x+4} < 0$

22. $x^2 + x - 12 \ge 0$

Solve each inequality. Express your answer in interval notation.

23. $3 < x + 4 < 5$

24. $-2 \le \frac{1}{2}x < 0$

25. $-5 < 4 - 3x \le 2$

26. $0 < \frac{3x+2}{2} \le 4$

27. A young adult may be defined as someone older than 21, but less than 30 years of age. Express this statement using inequalities.

28. In your Economics 101 class, you have scores of 68, 82, 87, and 89 on the first four of five tests. To get a grade of a B, the average of the first five test scores must be greater than or equal to 80 and less than 90.

a) Write an equality representing the above situation.

b) Solve the inequality to find the range of the score that you need on the last test to get a B.

c) What score do you need if the fifth test counts double?

29. The perimeter of a rectangle is 60 feet. Describe the possible lengths of a side if the area of the rectangle is not to exceed 161 square feet.

30. An open box is made from a rectangular piece of cardboard measuring 11 inches by 14 inches by cutting identical squares from the corners and turning up the sides. Describe the possible lengths of the side of the removed squares if the volume of the open box is not to exceed 132 cubic inches.

Review Exercises

Solve.

31. $x^2 - 4 = 0$

Simplify.

32. $3(2x + 5)(x - 2)$