Math 95 HW 14 (6.4a) Solving Rational Equations

Name: _____

Solving Rational Equations:

In exercises 15 - 48, solve the rational equation for the given variable. State your conclusion using set notation in a complete sentence. Check your solutions to exercises 17 and 21.

15. $\frac{x}{3} + \frac{1}{2} = \frac{5}{6}$

19. $\frac{x}{x-1} = \frac{4}{3}$

17. $\frac{2}{x} - \frac{7}{3} = -\frac{29}{15}$

21. $\frac{1}{2x} - \frac{5}{3x} = 1$

Check:

Check:

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

29. $\dfrac{6}{3z+4} = \dfrac{4}{2z-5}$

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

31. $\dfrac{5}{t-1} + \dfrac{2}{t+2} = \dfrac{15}{t^2+t-2}$

27. $\dfrac{3}{x-1} = \dfrac{6}{x+4}$

33. $\dfrac{1}{3n} - 2 = \dfrac{1}{2n}$

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

37. $\dfrac{x}{x+2} = \dfrac{4}{x-3}$

39. $\dfrac{2w+1}{3w} - \dfrac{4w-3}{w} = 0$

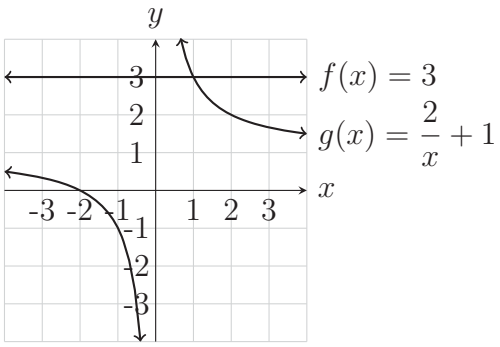
41. $\dfrac{3}{2y} + \dfrac{2y}{y-4} = -\dfrac{11}{2}$

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

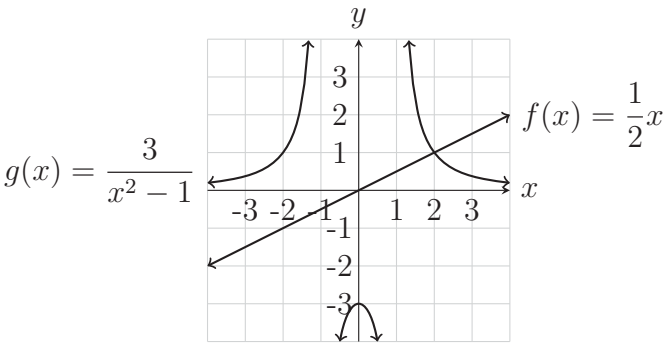
44. $\dfrac{1}{x^2-4} + \dfrac{1}{(x-2)^2} = \dfrac{2}{(x+2)^2}$

In exercises 53 and 55, use the provided graphs to determine the solution to the given equations. State your conclusion using set notation in a complete sentence.

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



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



In exercises 73 - 85, solve for the specified variable. State your conclusion using set notation in a complete sentence.

73. $t = \dfrac{d}{r}$ for r

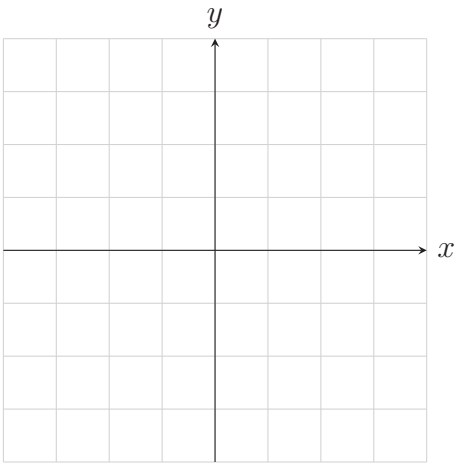
79. $\dfrac{1}{R} = \dfrac{1}{R_1} + \dfrac{1}{R_2}$ for R_1

In exercise 69, solve the equation numerically, symbolically, and graphically. Define a function to represent each side of the equation. Use your calculator to see what the graphs look like and determine the intersection of the functions. Sketch the graphs of the functions in the given coordinate plane for your graphical solutions. State your conclusions using set notation in a complete sentence.

69. $\dfrac{1}{x} + \dfrac{1}{x+2} = \dfrac{4}{3}$

a. Numerically:

b. Graphically:



c. Symbolically:

Conclusion: