

Name _____
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Date _____
Algebra II



Fractional Equations

Solve the following fractional equations and list the solutions as well as the extraneous solutions

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

2. $\frac{5x}{2} = \frac{1}{x} + \frac{x}{4}$

3. $\frac{x+2}{x} + \frac{x}{3} = \frac{2x^2+6}{3x}$

4. $\frac{1}{2x} - \frac{5}{6} = \frac{3}{x}$

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

6. $\frac{x}{x-1} = \frac{2}{x} + \frac{1}{x-1}$



$$7. \frac{3x+25}{x+7} - 5 = \frac{3}{x}$$

$$8. \frac{8}{x+5} - \frac{3}{x} = 5$$

$$9. \frac{7}{2x} - \frac{2}{x+1} = \frac{1}{4}$$

$$10. \frac{2}{n^2} + \frac{3}{n} = \frac{4}{n^2}$$

$$11. \frac{x+3}{x-5} + \frac{6}{x+2} = \frac{6+10x}{(x-5)(x+2)}$$

$$12. \frac{30}{x^2-9} + 1 = \frac{5}{x-3}$$

$$13. \frac{1}{x-2} + \frac{4}{x+5} = \frac{7}{x^2+3x-10}$$

$$14. \frac{x}{x+3} + \frac{2}{x-4} = \frac{2x+27}{x^2-x-12}$$

$$15. \frac{1}{x-6} + \frac{x}{x-2} = \frac{4}{x^2-8x+12}$$

$$16. \frac{4}{k^2-8k+12} = \frac{k}{k-2} + \frac{1}{k-6}$$

$$17. \frac{x}{x+2} + \frac{1}{x^2-4} = \frac{4}{x-2}$$

$$18. \frac{2}{x+3} - \frac{3}{4-x} = \frac{2x-2}{x^2-x-12}$$

19. Markus is a long-distance walker. In one race, he walked 55 miles in t hours and in another race walked 65 miles in $t + 3$ hours. His rates are shown in the equations below.

$$r = \frac{55}{t} \quad r = \frac{65}{t + 3}$$

Markus walked at an equivalent rate, r , for each race. Determine the number of hours that each of the two races took.

20. Sarah is fighting a sinus infection. Her doctor prescribed a nasal spray and an antibiotic to fight the infection. The active ingredients, in milligrams, remaining in the bloodstream from the nasal spray, $n(t)$, and the antibiotic, $a(t)$, are modeled in the functions below, where t is the time in hours since the medications were taken.

$$n(t) = \frac{t+1}{t+5} + \frac{18}{t^2 + 8t + 15}$$

$$a(t) = \frac{9}{t+3}$$

Determine which drug is made with a greater initial amount of active ingredient. Justify your answer. Sarah's doctor told her to take both drugs at the same time. Determine algebraically the number of hours after taking the medications when both medications will have the same amount of active ingredient remaining in her bloodstream.

21. To solve the equation $\frac{7}{x+7} + \frac{4x}{x-7} = \frac{3x+7}{x-7}$, Joan's first step is to multiply both sides by the least common denominator. Which statement is true?

- 1) -14 is an extraneous solution.
- 2) 7 and -7 are extraneous solutions.
- 3) 7 is an extraneous solution.
- 4) There are no extraneous solutions.

22. To solve $\frac{2x}{x-2} - \frac{11}{x} = \frac{8}{x^2-2x}$, Ren multiplied both sides by the least common denominator.

Which statement is true?

- 1) 2 is an extraneous solution.
- 2) $\frac{7}{2}$ is an extraneous solution.
- 3) 0 and 2 are extraneous solutions.
- 4) This equation does not contain any extraneous solutions.

23. Jin solved the equation $\sqrt{4-x} = x+8$ by squaring both sides. What extraneous solution did he find?

- 1) -5
- 2) -12
- 3) 3
- 4) 4