

10.4 Solve Rational Equations

Write your questions here!



SOLVE. CHECK FOR EXTRANEIOUS SOLUTIONS!

$$\frac{1}{3} + \frac{x}{4} = 2$$

$$\frac{1}{3} + \frac{4}{x} = \frac{2}{5}$$

Excluded Value(s):

$$\frac{2}{3x} + \frac{1}{6} = \frac{4}{3x}$$

$$\frac{x}{2} - \frac{1}{x+3} = x$$

$$\frac{2x}{x^2 - x - 12} + \frac{5}{x+3} = \frac{2}{x-4}$$

$$\frac{6}{x-3} = \frac{8x^2}{x^2-9} - \frac{4x}{x+3}$$

OLD SCHOOL STUFF

$$12 = \frac{5x + 6}{2x - 1}$$

$$\frac{12}{4x - 1} = \frac{6}{2x + 1}$$

TRY IT!

$$\frac{4}{x} + x = 5$$

$$\frac{3x + 6}{4x - 1} = -6$$

$$\frac{18}{x^2 - 3x} - \frac{6}{x - 3} = \frac{5}{x}$$

SUMMARY:

Now,
summarize
your notes
here!



Solve each equation. Check for extraneous solutions.

1.

$$\frac{a+4}{2a} + 2 = \frac{3}{2}$$

2.

$$\frac{3m+15}{m^2} - \frac{1}{m} = 1$$

3.

$$8 = \frac{1+2x}{3x-5}$$

4.

$$\frac{4}{3} - \frac{y}{y+1} = \frac{1}{2}$$

5.

$$\frac{-3d}{4d+8} + 2 = \frac{5}{d+2}$$

6.

$$\frac{-4}{n-2} = \frac{n}{3n-6}$$

7.

$$\frac{1}{r+2} + \frac{r-1}{r^2+6r+8} = \frac{1}{r+4}$$

8.

$$\frac{1}{5w-5} = \frac{1}{w-3} + \frac{w+2}{5w^2-20w+15}$$

9.

$$\frac{1}{k^2} + \frac{k+3}{2k} = \frac{1}{2}$$

10.

$$\frac{9}{h^2 - 6h + 9} = \frac{3h}{h^2 - 3h}$$

ERROR ANALYSIS Describe and correct the error.

11.

$$\frac{3}{x^2} + \frac{5}{2x} = \frac{1}{2}$$

$$6x + 5x = x^2$$

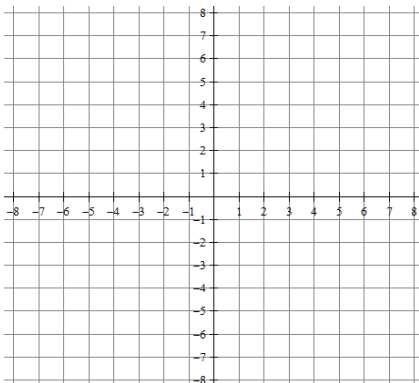
$$11x = x^2$$

$$0 = x^2 - 11x$$

$$0 = x(x - 11)$$

$$x = 0, 11$$

$$x \neq 0 \text{ because it extraneous}$$

**Algebra Skillz****GRAPH**1. Sketch a graph of $f(x) = |x + 3| - 4$ **SIMPLIFY**

2. $3\sqrt{2}(2 + 4\sqrt{5})$

3. $(5 + \sqrt{2})(3 - \sqrt{2})$

SOLVE

4. Factor: $7x^2 + 72x + 20$

5. Solve by factoring.

$$4x^2 - 81 = 0$$

Solve. Check for extraneous solutions.

1.

$$\frac{4x - 2}{x + 5} = -5$$

2.

$$\frac{4}{b - 3} + \frac{6}{3b - 9} = \frac{b}{3}$$

3. Mr. Kelly has a head cold and takes some Algebrobitussin Cough Syrup to help him feel better. The concentration C (in mg) of medicine in his bloodstream is modeled by the equation below. Where t is the time (in hours) after taking the medicine.

$$C(t) = \frac{50t}{t^2 + 25}$$

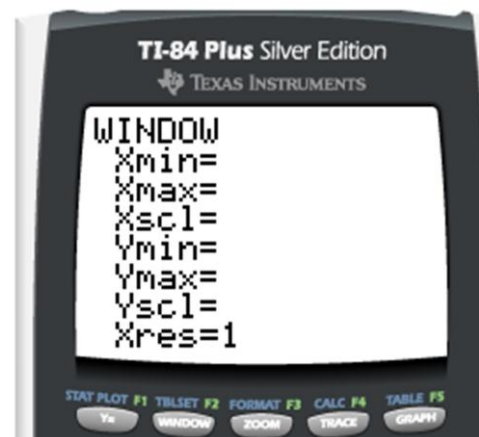
a. What does $C(2.5)$ mean? Find it.

b. What does $C(t) = 4$ mean? Find it.

c. Graph with a friendly window that shows a 24 hour time period of the medicine concentration. Record below.

d. What is the maximum concentration?

e. The label says not to operate heavy machinery if your concentration is 3 or above. When is it safe for Mr. Kelly to operate heavy machinery?



4. **I WORK OUT** Classic Algebra work problems can be solved using rational equations. Check this one out. Mr. Bean can make 1 Algebro video in 8 hours. If Mr. Sullivan helps him, they can finish 1 video in 2 hours. How fast can Mr. Sullivan make a video on his own? The table helps to explain the equation that models this.

	Work Rate	Time	=	Work Done
Mr. Bean	$\frac{1 \text{ video}}{8 \text{ hours}}$	2 hours		$\frac{2}{8}$ of a video
Mr. Sullivan	$\frac{1 \text{ video}}{x \text{ hours}}$	2 hours		$\frac{2}{x}$ of a video

Solve the equation that models this situation. \longrightarrow $\frac{2}{8} + \frac{2}{x} = 1$

5. **YOU WORK OUT** Now, fill out a table like the one above and create your own equation to solve this problem. Mr. Kelly can make a quilt in 12 hours. If Mr. Brust helps him, they can finish a quilt in 10 hours. How fast can Mr. Brust make a quilt on his own?

	Work Rate	Time	=	Work Done
Mr. Kelly				
Mr. Brust				

6. **SAT PREP**

MULTIPLE CHOICE

What is(are) the solution(s) of $\frac{2}{x-3} = \frac{1}{x^2-2x-3}$

- (A) $-3, -\frac{1}{2}$
- (B) $-\frac{1}{2}, 3$
- (C) $-\frac{1}{2}$
- (D) 3
- (E) None of the above

GRID IN

Find the value of k , $\frac{\frac{k}{x}}{\frac{1}{2} - \frac{3}{4}} = \frac{12}{-x}$

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9