

5.3 HW: Solving Rational Equations

Solve each equation. Remember to check for extraneous solutions!!!

1. $\frac{p-4}{5p} = \frac{1}{5p} - \frac{p-3}{p}$

$$p = \frac{10}{3}$$

2. $\frac{5}{k^2} = \frac{1}{k} - \frac{1}{k^2}$

$$k = 6$$

3. $\frac{2a-12}{a} = \frac{2a+6}{a} + \frac{2a-2}{a}$

$$a = -8$$

$$4. \frac{7}{r+5} = \frac{1}{r+5} + \frac{4r-32}{r^2-25}$$

$$r = -\frac{2}{3}$$

$$5. \frac{5r+2}{r^2-2r} = \frac{1}{r} - \frac{r+6}{r^2-2r}$$

$$r = -2$$

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

$$x = \frac{7}{3}$$

$$7. \frac{1}{2v-7} + v + 8 = \frac{v^2+4v-5}{2v-7}$$

$$v = 5$$

$$v = -10$$

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

$$k = 7$$

$$9. \frac{2}{x+4} - \frac{x^2-x-2}{x^2+9x+20} = \frac{3x+6}{x+4}$$

$$x = -\frac{3}{2}, x = -3$$

$$10. \frac{a-7}{a-3} = \frac{7}{a^2-2a-3} + 1$$

$$a = -\frac{11}{4}$$

$$11. \frac{3m-18}{m^2+2m} + \frac{m+1}{m+2} = 1$$

$$m = 9$$

$$12. \frac{10}{x^2-2x} + \frac{4}{x} = \frac{5}{x-2}$$

NO solution

13. One pump can fill a tank with oil in 4 hours. A second pump can fill the same tank in 3 hours. If both pumps are used at the same time, how long will they take to fill the tank?

$$12/7 \text{ hr} \approx 1.71 \text{ hr}$$

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14. A flight along the US takes longer east to west than it does west to east. Assume that winds are constant in an eastward direction. When flying westward, the headwind decreases the airplane's speed. When flying eastward, the tailwinds increases its speed. The time for a roundtrip flight from Salt Lake City to New York City (1970 miles) is 9.75 hours. If the airplane cruises at 408 mi/hr, what is the speed of the wind?

about 40 mph

15. Garth can row 5 miles per hour in still water. It takes him as long to row 4 miles upstream as 16 miles downstream. How fast is the current?

about 2.6 mph

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16. You can wash a car 1.5 times as fast as your friend. Working together, the two of you can wash 1 car in 6 minutes. How long does it take each of you to wash the car when working alone.

You: 10 min
Friend: 15 min