Solving Rational EQs

Determine whether the given *x*-value is a solution of the equation.

1. $\frac{4}{2x-3}+\frac{2}{x+4}=\frac{2x}{x^2-8};\ x=\frac{3}{2}$

2. $\frac{x}{x+4}-\frac{2}{x}=\frac{2x-8}{x^2};\ x=4$

Solve the equation by cross multiplying. Check for extraneous solutions.

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

4. $\frac{1}{x+5}=\frac{2}{7x}$

5. $\frac{x}{3}=\frac{-2}{x+7}$

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

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

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

9. $\frac{x-5}{-3}=\frac{4}{x+2}$

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

Solve the equation by using the LCD. Check for extraneous solutions.

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

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

13. $1+\frac{6}{x}=\frac{2x-4}{x}-3$

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

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

16. $\frac{x^2}{3x-1} + 2 = \frac{2(x-3)}{3x-1}$

17. $\frac{x}{2x-1} - \frac{2}{2x+1} = \frac{x^2+20}{4x^2-1}$

18. $x + \frac{5}{x+6} = \frac{6x-1}{x+6}$

19. **Average Cost** It costs a manufacturing company \$8 to produce one can of paint. If the initial investment in the production line was \$50,000, how many cans of paint must be produced before the average cost per can falls to \$10?

20. **Brakes** The braking distance of a car can be modeled by $d = s + \frac{s^2}{20}$ where d is the distance (in feet) that the car travels before coming to a stop, and s is the speed at which the car is traveling (in miles per hour). Find the speed that results in a braking distance of 240 feet.

In Exercises 21 and 22, use the following information.

Fuel Efficiency The cost of fueling your car for one year can be calculated using this equation: Fuel cost for one year $= \frac{(\text{Miles driven} \times \text{Price per gallon})}{\text{Fuel efficiency rate}}$

21. Last year you drove 22,500 miles, paid \$2.25 per gallon of gasoline, and spent a total of \$2025 on gasoline. What is the fuel efficiency rate of your car?

22. How much would you have saved if your car's fuel efficiency rate were 35 miles per gallon?