



Examples 1–3 Solve each equation. State any extraneous solutions.

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

2. $\frac{t+3}{5} = \frac{2t+3}{9}$

3. $\frac{a+3}{a} - \frac{6}{5a} = \frac{1}{a}$

4. $4 - \frac{p}{p-1} = \frac{2}{p-1}$

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

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

Example 4 7. **WEEDING** Maurice can weed the garden in 45 minutes. Olinda can weed the garden in 50 minutes. How long would it take them to weed the garden if they work together?

Example 5 8. **LANDSCAPING** Hunter is filling a 3.5-gallon bucket to water plants at a faucet that flows at a rate of 1.75 gallons a minute. If he were to add a hose that flows at a rate of 1.45 gallons per minute, how many minutes would it take him to fill the bucket? Round to the nearest tenth.

Practice and Problem Solving

Extra Practice is on page R11.

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9. $\frac{8}{n} = \frac{3}{n-5}$

10. $\frac{6}{t+2} = \frac{4}{t}$

11. $\frac{3g+2}{12} = \frac{g}{2}$

12. $\frac{5h}{4} + \frac{1}{2} = \frac{3h}{8}$

13. $\frac{2}{3w} = \frac{2}{15} + \frac{12}{5w}$

14. $\frac{c-4}{c+1} = \frac{c}{c-1}$

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

16. $\frac{y+4}{y-2} + \frac{6}{y-2} = \frac{1}{y+3}$

17. $\frac{a}{a+3} + \frac{a^2}{a+3} = 2$

18. $\frac{12}{a+3} + \frac{6}{a^2-9} = \frac{8}{a+3}$

19. $\frac{3n}{n-1} + \frac{6n-9}{n-1} = 6$

20. $\frac{n^2-n-6}{n^2-n} - \frac{n-5}{n-1} = \frac{n-3}{n^2-n}$

Example 4 21. **PAINTING** It takes Noah 3 hours to paint one side of a fence. It takes Gilberto 5 hours. How long would it take them if they worked together?

22. **DISHWASHING** Ron works as a dishwasher and can wash 500 plates in two hours and 15 minutes. Chris can finish the 500 plates in 3 hours. About how long would it take them to finish all of the plates if they work together?

Example 5 23. **ICE** A hotel has two ice machines in its kitchen. How many hours would it take both machines to make 60 pounds of ice? Round to the nearest tenth.



24. **CYCLING** Two cyclists travel in opposite directions around a 5.6-mile circular trail. They start at the same time. The first cyclist completes the trail in 22 minutes and the second in 28 minutes. At what time do they pass each other?

GRAPHING CALCULATOR For each function, a) describe the shape of the graph, b) use factoring to simplify the function, and c) find the zeros of the function.

25. $f(x) = \frac{x^2-x-30}{x-6}$

26. $f(x) = \frac{x^3+x^2-2x}{x+2}$

27. $f(x) = \frac{x^3+6x^2+12x}{x}$

28. **CCSS REASONING** Morgan can paint a standard-sized house in about 5 days. For his latest job, Morgan hires two assistants. At what rate must these assistants work for Morgan to meet a deadline of two days?

