

36. **Fuel Economy** Suppose you drive an average of 15,000 miles per year, and your car gets 24 miles per gallon. Suppose gasoline costs \$1.60 a gallon.
- How much money do you spend each year on gasoline?
 - You plan to trade in your car for one that gets x more miles per gallon. Write an expression to represent the new yearly cost of gasoline.
 - Write an expression to represent your savings on gasoline.
 - Suppose you save \$200 a year with the new car. How many miles per gallon does the new car get?

37. **Open-Ended** Write a rational equation that has the same solution as the question in the cartoon.

38. **Industry** The average hourly wage $H(x)$ of workers in an industry is modeled by the function $H(x) = \frac{16.24x}{0.062x + 39.42}$, where x represents the number of years since 1970.

- In what year does the model predict that wages will be \$25/h?
- Critical Thinking** Is the prediction reasonable? Explain.

The Family Circus by Bil Keane



"What's 129 divided by 4?"

Solve each equation. Check each solution.

39. $\frac{15}{x} + \frac{9x - 7}{x + 2} = 9$

41. $\frac{1}{b + 1} + \frac{1}{b - 1} = \frac{2}{b^2 - 1}$

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

45. $\frac{1}{x - 5} = \frac{x}{x^2 - 25}$

47. $\frac{3}{x + 5} + \frac{2}{5 - x} = \frac{-4}{x^2 - 25}$

49. $\frac{5}{x^2 - 7x + 12} - \frac{2}{3 - x} = \frac{5}{x - 4}$

51. $\frac{7x + 3}{x^2 - 8x + 15} + \frac{3x}{x - 5} = \frac{1}{3 - x}$

40. $\frac{2}{x + 2} - \frac{1}{x} = \frac{-4}{x(x + 2)}$

42. $c - \frac{c}{3} + \frac{c}{5} = 26$

44. $\frac{1}{8} + \frac{5x}{x + 2} = \frac{5}{2}$

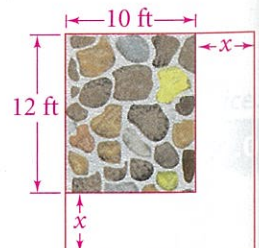
46. $\frac{k}{k + 1} + \frac{k}{k - 2} = 2$

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

50. $\frac{10}{2y + 8} - \frac{7y + 8}{y^2 - 16} = \frac{-8}{2y - 8}$

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

53. **Landscape Design** Suppose you want to double the area of the patio shown at the right. Find the increase x of both the length and width of the patio.



54. **Writing** Write and solve a problem that can be modeled by a rational equation.

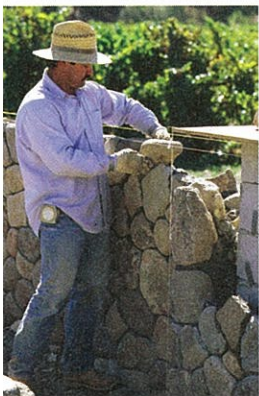
55. **Transportation** A plane flies from New York to Chicago (about 700 miles) at a speed of 360 mi/h.

- The speed s of the plane is given by $s = \frac{d}{t}$. d represents the distance and t is the time. Solve the equation for t .

- Find the time for the trip.

- On the return trip from Chicago to New York, a tail wind helps the plane move faster. Write an expression for the speed of the plane on the return trip. Let x represent the speed of the tail wind.

- The total flying time for the round trip is 3.5 h. Write a rational equation for the sum of the flying times. Find the speed x of the tail wind.



World Connection

area of a structure
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