

Concept and Vocabulary:

1. Solving a formula for a variable means rewriting the formula so that the variable is _____.
2. The area, A , of a rectangle with length l and width w is given by the formula _____.
4. The sentence “ A is P percent of B ” is expressed by the formula _____.

Practice Exercises:

In exercises 1 - 25 odd, solve each formula for the specified variable. Describe the set of solutions using set notation. Do you recognize the formula? If so, what does it describe?

1. $d = rt$ for r

5. $C = 2\pi r$ for r

3. $I = Prt$ for P

7. $E = mc^2$ for m

9. $y = mx + b$ for m

17. $\frac{c}{2} + 80 = 2F$ for c

11. $T = D + pm$ for D

19. $A = \frac{1}{2}(a + b)$ for a

13. $A = \frac{1}{2}bh$ for b

21. $S = P + Prt$ for r

15. $M = \frac{n}{5}$ for n

23. $A = \frac{1}{2}h(a + b)$ for b

25. $Ax + By = C$ for x

Supplemental Questions:

In the first 5 supplemental questions, express each percent as a decimal.

1. 27%

4. 3%

2. 63.4%

5. $\frac{1}{2}\%$

3. 170%

In supplemental questions 6 - 9, express each decimal as a percent.

1. 0.89

3. 4.78

2. 0.002

4. 100

Practice Exercises:

Translate the following sentences into an algebraic equation. Solve the equation and then state a conclusion based upon your results.

27. What is 3% of 200?

35. 3 is what percent of 15?

29. What is 18% of 40?

37. What percent of 2.5 is 0.3?

31. 3 is 60% of what?

39. If 5 is increased to 8, the increase is what percent of the original number?

33. 24% of what number is 40.8?

41. If 4 is decreased to 1, the decrease is what percent of the original number?

In exercises 43 - 49 odd, solve each equation for x . Describe the set of solutions in set notation.

43. $y = (a + b)x$

47. $y = cx + dx$

45. $y = (a - b)x + 5$

49. $y = Ax - Bx - C$

Application Exercises:

51. The average, or mean, A , of three exam grades, x , y , and z , is given by the formula

$$A = \frac{x + y + z}{3}.$$

a. Solve the formula for z .

b. Use the formula in part (a) to solve the following problem: On your first two exams, your grades are 86% and 88% so $x = 86$ and $y = 88$. What must you get on the third exam to have an average of 90%?

53. If you are traveling in your car at an average rate of r miles per hour for t hours, then the distance, d , in miles, that you travel is described by the formula $d = rt$: distance equals rate times time.
- Solve the formula for t .
 - Use the formula in part (a) to find the time that you travel if you cover a distance of 100 miles at an average rate of 40 miles per hour.
61. A charity has raised \$7500, with a goal of raising \$60,000. What percent of the goal has been raised?
63. A restaurant bill came to \$60. If 15% of this amount was left as a tip, how much was the tip?

65. Suppose that the local sales tax rate is 6% and you buy a car for \$16,800.
- How much tax is due?
 - What is the car's total cost after tax?
71. Suppose that you put \$10,000 in a rather risky investment recommended by your financial advisor. During the first year, your investment decreases by 30% of its original value. During the second year, your investment increases by 40% of its first-year value. Your advisor tells you that there must have been a 10% overall increase of your original \$10,000 investment. Is your financial advisor using percentages properly? If not, what is the actual percent gain or loss on your original \$10,000 investment?