1.7 Practice WITH CalcChat® AND CalcView®

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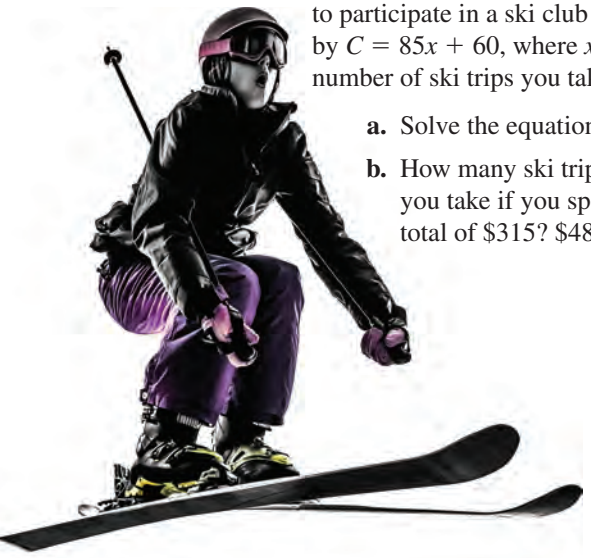
In Exercises 1–10, solve the literal equation for y. *Example 1*

1. $y - 3x = 13$
2. $2x + y = 7$
3. $2y - 18x = -26$
4. $20x + 5y = 15$
5. $9x - y = 45$
6. $6x - 3y = -6$
7. $4x - 5 = 7 + 4y$
8. $16x + 9 = 9y - 2x$
9. $2 + \frac{1}{6}y = 3x + 4$
10. $11 - \frac{1}{2}y = 3 + 6x$

In Exercises 11–20, solve the literal equation for x. *Example 2*

11. $y = 4x + 8x$
12. $m = 10x - x$
13. $a = 2x + 6xz$
14. $y = 3bx - 7x$
15. $y = 4x + rx + 6$
16. $z = 8 + 6x - px$
17. $sx + tx = r$
18. $a = bx + cx + d$
19. $12 - 5x - 4kx = y$
20. $x - 9 + 2wx = y$

21. **MODELING REAL LIFE** The total cost C (in dollars) to participate in a ski club is given by $C = 85x + 60$, where x is the number of ski trips you take.



   a. Solve the equation for x.

   b. How many ski trips did you take if you spent a total of \$315? \$485?

22. **MODELING REAL LIFE** The penny size of a nail indicates the length of the nail. The penny size d of a nail that is 1 to 3 inches long is given by $d = 4n - 2$, where n is the length (in inches) of the nail.

   a. Solve the equation for n.

   b. Find the lengths of nails with the following penny sizes: 3, 6, and 10.

ERROR ANALYSIS **In Exercises 23 and 24, describe and correct the error in solving the equation for x.**

23. ✗
$$12 - 2x = -2(y - x)$$
$$-2x = -2(y - x) - 12$$
$$x = (y - x) + 6$$

24. ✗
$$10 = ax - 3b$$
$$10 = x(a - 3b)$$
$$\frac{10}{a - 3b} = x$$

In Exercises 25–28, solve the formula for the indicated variable. *Examples 3 and 5*

25. Profit: $P = R - C$; Solve for C.
26. Surface area of a cylinder: $S = 2\pi r^2 + 2\pi rh$; Solve for h.
27. Area of a trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$; Solve for b_2.
28. Average acceleration of an object: $a = \frac{v_1 - v_0}{t}$; Solve for v_1.
29. **REWRITING A FORMULA** A common statistic used in professional football is the quarterback rating. This rating is made up of four major factors. One factor is the completion rating given by the formula

$$R = 5\left(\frac{C}{A} - 0.3\right)$$

   where C is the number of completed passes and A is the number of attempted passes. Solve the formula for C.

30. **REWRITING A FORMULA** Newton's law of gravitation is given by the formula

$$F = G\left(\frac{m_1 m_2}{d^2}\right)$$

   where F is the force between two objects of masses m_1 and m_2, G is the gravitational constant, and d is the distance between the two objects. Solve the formula for m_1.

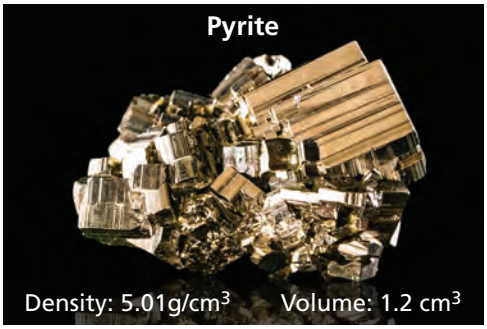
31. **MODELING REAL LIFE** The sale price S (in dollars) of an item is given by the formula $S = L - rL$, where L is the list price (in dollars) and r is the percent of discount (in decimal form).

Examples 4 and 6

a. Solve the formula for r.

b. The list price of the shirt is \$21.50. What is the percent of discount?

32. **MODELING REAL LIFE** The density d of a substance is given by the formula $d = \frac{m}{V}$, where m is its mass and V is its volume.



a. Solve the formula for each of the other two variables.

b. Find the mass of the pyrite sample. Explain how you found the mass.

33. **MAKING AN ARGUMENT** Your friend claims that Thermometer A displays a greater temperature than Thermometer B. Is your friend correct? Explain your reasoning.

Thermometer A

Thermometer B

34. **MODELING REAL LIFE** You deposit \$2000 in an account that earns simple interest at an annual rate of 4%. How long must you leave the money in the account to earn \$500 in interest? *Example 7*

35. **MODELING REAL LIFE** A flight averages 460 miles per hour. The return flight averages 500 miles per hour due to a tailwind. The total flying time is 4 hours and 48 minutes. How long is each flight? Explain. *Example 8*

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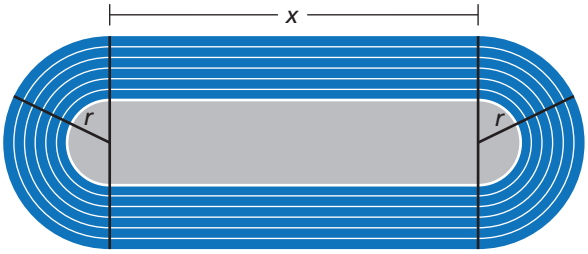
36. **MODELING REAL LIFE** An athletic facility is building an indoor track. The track is composed of a rectangle and two semicircles, as shown.



a. Write a formula for the perimeter of the indoor track. Then solve the formula for x.

b. The perimeter of the track is 660 feet, and r is 50 feet. Find x. Round your answer to the nearest foot.

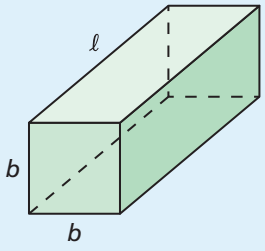
37. **MODELING REAL LIFE** A vehicle travels 55 miles per hour and 20 miles per gallon.

a. Write an equation that represents the distance d (in miles) that the vehicle travels in t hours. Then write an equation that represents the distance d (in miles) that the vehicle travels using g gallons of gasoline.

b. Write an equation that relates g and t. Then solve the equation for g.

c. The vehicle travels for 6 hours. How many gallons of gasoline does the vehicle use? How far does it travel? Explain.

38. **HOW DO YOU SEE IT?**
The rectangular prism shown has square bases.



a. Use the figure to write a formula for the surface area S of the prism.

b. Your teacher asks you to solve the formula for either b or ℓ. Which would you choose? Explain.

DIG DEEPER **In Exercises 39 and 40, solve the literal equation for a.**

39. $x = \frac{a + b + c}{ab}$

40. $y = x\left(\frac{ab}{a - b}\right)$