

$$^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32$$

14.  $122^{\circ}\text{F} \rightarrow ^{\circ}\text{C}$

$$122 = \frac{9}{5} C + 32$$

$$5(90) = \cancel{5} \frac{9}{\cancel{5}} C$$

$$\frac{450}{9} = \frac{9C}{9}$$

$$50 = C$$

$$3. \quad A = \frac{1}{2}h(B+b)$$

$$A = 10$$

$$B = 4$$

$$b = 1$$

$$h = ?$$

$$10 = \frac{1}{2}h(4+1)$$

$$2(10) = \cancel{\frac{2}{1}} \frac{1}{2} h (5)$$

$$\frac{20}{5} = \frac{h(5)}{5}$$

$$4 = h$$

$$6. \quad q = r + rst$$

$\quad \quad \quad -r \quad \quad \quad -r$

⑤

$$\frac{q-r}{rt} = \frac{rst}{rt}$$

$$\frac{q-r}{rt} = s$$

36. \$30,000      8%    9%

Total Interest: \$2,410

How much  
at 8% = X  
9% =

Label	Amt Invested	Int Rate	Int
8%	X	8%	.08X
9%	30,000 - X	9%	.09(30,000 - X)
TOTAL	30,000		2,410

$$.08X + .09(30,000 - X) = 2410$$

$$.08X + 2700 - .09X = 2410$$

$$2700 - .01X = 2410$$

$$\begin{array}{r} -2700 \qquad \qquad -2700 \\ 2700 - .01X = 2410 \\ \hline \end{array}$$

$$-.01X = -290$$

$$-.01x = -290$$

$$x = 29,000$$

\$29,000 at 8%

1,000 at 9%

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18. The number 38.5 is is what percent  
of 55?

$$\frac{38.5}{55} = \frac{x(55)}{55}$$

$$.7 = x$$

$$70\% = x$$

34.

distance = (rate)(time)

	Rate	Time	Dist
Freight	55	T+4	55(T+4)
Passenger	66	T	66T

$$66T = 55(T+4)$$

$$66T = 55T + 220$$

$$11T = 220$$

$$T = 20$$

Passenger train will catch the freight train  
after 20 hours.

Distance is  $66(20) = 1320$  miles

$$8. \quad V = 2\pi c t + 7\pi c^2$$

$-7\pi c^2$                        $-7\pi c^2$

$$\frac{V - 7\pi c^2}{2\pi c} = \frac{2\pi c t}{2\pi c}$$

$$\frac{V - 7\pi c^2}{2\pi c} = t$$

39.

no. of dimes :  $d = 244$

no. of nickels :  $n = 122$

$$d = 2n$$

$$10d + 5n = 3050$$

$$10(2n) + 5n = 3050$$

$$\frac{25n}{25} = \frac{3050}{25}$$

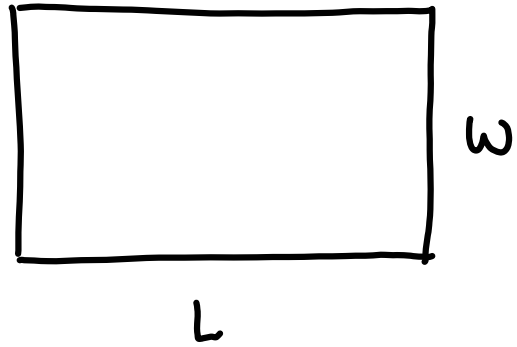
$$n = 122$$

11.

$$w = \frac{2}{3}L$$

$$w =$$

$$L =$$



$$P = 220$$

$$P = 2L + 2w$$

$$2L + 2w = 220$$

$$2L + \frac{2}{1} \left( \frac{2}{3}L \right) = 220$$

$$3 \cdot \frac{2L}{1} + \frac{4}{3}L = 220$$

$$\frac{6}{3}L + \frac{4}{3}L = 220$$

$$\frac{3}{10} \left( \frac{10}{3}L \right) = \left( \frac{220}{1} \right) \left( \frac{3}{10} \right)$$

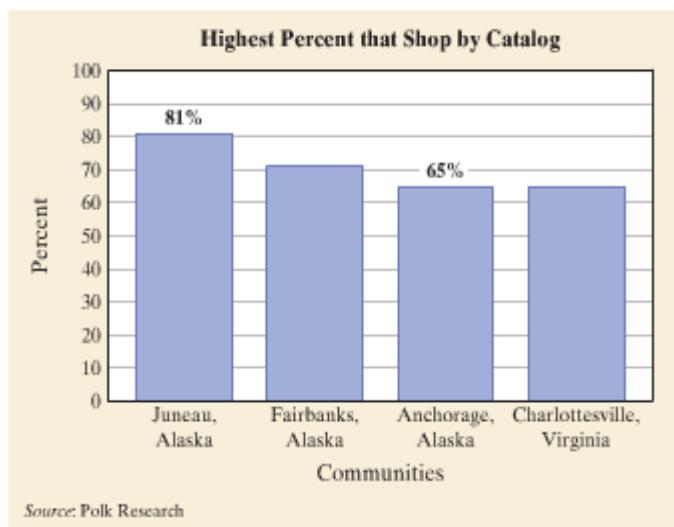
$$L = 66$$

$$W = \frac{2}{3}L = \frac{2}{3} \left( \frac{66}{1} \right) = 44$$

test Thu!

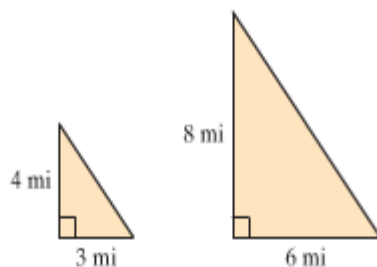
26. Planter's Peanut Company wants to mix 20 pounds of peanuts worth \$3 a pound with cashews worth \$5 a pound in order to make an experimental mix worth \$3.50 a pound. How many pounds of cashews should be added to the peanuts?

	<i>Number of Pounds</i>	<i>Cost per Pound</i>	<i>= Value</i>
<i>\$3 per lb Peanuts</i>			
<i>\$5 per lb Cashews</i>			
<i>\$3.50 per lb Mixture Wanted</i>			



34. Estimate the percent of the population in Charlottesville, Virginia, who shops by catalog.
36. According to the *World Almanac*, Juneau has a population of 30,987. How many catalog shoppers might we predict live in Juneau? Round to the nearest whole number.
40. A gasoline station decreased the price of a \$0.95 cola by 15%. Find the decrease in price and the new price.

42. The lettuce consumption per capita in 1980 was about 25.6 pounds, and in 2005 the consumption dropped to about 22.4 pounds. Find the percent decrease. (*Source: Statistical Abstract of the United States.*)
44. Fuel ethanol production is projected to be 10,800 million gallons in 2009. This represents a 44% increase from the number of gallons produced in 2007. How many millions of gallons were produced in 2007? (*Source: Renewable Fuels Association*)
46. How much water should be added to 30 gallons of a solution that is 70% antifreeze in order to get a mixture that is 60% antifreeze?
48. The price of a biology book recently increased by 10%. If this book originally cost \$99.90, find the mark-up and the new price.
50. By doubling each dimension, the area of a triangle increased from 6 square miles to 24 square miles. Find the percent increase in area.



52. The average number of children born to each U.S. woman has decreased by 44% since 1920. If this average is now 1.9, find the average in 1920. Round to the nearest tenth.

54. A new self-tanning lotion for everyday use is to be sold. First, an experimental lotion mixture is made by mixing 800 ounces of everyday moisturizing lotion worth \$0.30 an ounce with self-tanning lotion worth \$3 per ounce. If the experimental lotion is to cost \$1.20 per ounce, how many ounces of the self-tanning lotion should be in the mixture?
56. The average size of farms in the United States was 436 acres in 2000. By 2005, the average size had increased to 444 acres. What was the percent increase? Round to the nearest tenth of a percent. (*Source:* USDA: National Agricultural Statistical Service)
60. At this writing, the women's world record for throwing a disc (like a heavy Frisbee) was set by Jennifer Griffin of the United States in 2000. Her throw was 138.56 meters. The men's world record was set by Christian Sandstrom of Sweden in 2002. His throw was 80.4% farther than Jennifer's. Find the distance of his throw. Round to the nearest meter. (*Source:* World Flying Disc Federation)
62. A recent survey showed that 64% of U.S. colleges have Internet access in their classrooms. There are approximately 9800 post-secondary institutions in the United States. How many of these would you expect to have Internet access in their classrooms? (*Source:* Market Data Retrieval, National Center for Education Statistics)
72. a. Can an item be marked-up by more than 100%? Why or why not?  
b. Can an item be discounted by more than 100%? Why or why not?

<b>Nutrition Facts</b>			
Serving Size	18 Crackers (31g)		
Servings Per Container	About 9		
<b>Amount Per Serving</b>			
<b>Calories</b> 130	<b>Calories from Fat</b> 35		
% Daily Value*			
<b>Total Fat</b> 4g	<b>6%</b>		
Saturated Fat 0.5g	<b>3%</b>		
Polyunsaturated Fat 0g			
Monounsaturated Fat 1.5g			
<b>Cholesterol</b> 0mg	<b>0%</b>		
<b>Sodium</b> 230mg	<b>x</b>		
<b>Total Carbohydrate</b> 23g	<b>y</b>		
Dietary Fiber 2g	<b>8%</b>		
Sugars 3g			
<b>Protein</b> 2g			
Vitamin A 0%	Vitamin C 0%		
Calcium 2%	Iron 6%		
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	30g	35g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

74. Based on a 2000-calorie diet, what percent of daily value of total carbohydrate is contained in a serving of this food? In other words, find  $y$  in the label. (Round to the nearest tenth of a percent.)

## 2.8: Further Problem Solving

### General Strategy for Problem Solving

1. UNDERSTAND the problem. During this step, become comfortable with the problem. Some ways of doing this are:
  - Read and reread the problem.
  - Choose a variable to represent the unknown.
  - Construct a drawing, whenever possible.
  - Propose a solution and check. Pay careful attention to how you check your proposed solution. This will help writing an equation to model the problem.
2. TRANSLATE the problem into an equation.
3. SOLVE the equation.
4. INTERPRET the results: *Check* the proposed solution in the stated problem and *state* your conclusion.

Ex: (p 143)

2. How long will it take a bus traveling at 60 miles per hour to overtake a car traveling at 40 mph if the car had a 1.5-hour head start?
4. The Jones family drove to Disneyland at 50 miles per hour and returned on the same route at 40 mph. Find the distance to Disneyland if the total driving time was 7.2 hours.

14. A bank teller is counting \$20 and \$50-dollar bills. If there are six times as many \$20 bills as \$50 bills and the total amount of money is \$3910, find the number of each denomination.

	<i>Number of Bills</i>	<i>Value of Bills</i>
<i>\$20 bills</i>		
<i>\$50 bills</i>		
<i>Total</i>		

16. Karen Waugtal invested some money at 9% annual simple interest and \$250 more than that amount at 10% annual simple interest. If her total yearly interest was \$101, how much was invested at each rate?
20. A zoo in Oklahoma charged \$22 for adults and \$15 for children. During a summer day, 732 zoo tickets were sold and the total receipts were \$12,912. How many children and how many adult tickets were sold?
22. Ms. Mills invested her \$20,000 bonus in two accounts. She took a 4% loss on one investment and made a 12% profit on another investment, but ended up breaking even. How much was invested in each account?
24. Kathleen and Cade Williams leave simultaneously from the same point hiking in opposite directions, Kathleen walking at 4 miles per hour and Cade at 5 mph. How long can they talk on their walkie-talkies if the walkie-talkies have a 20-mile radius?

28. Trudy Waterbury, a financial planner, invested a certain amount of money at 9% annual simple interest, twice that amount at 10% annual simple interest, and three times that amount at 11% annual simple interest. Find the amount invested at each rate if her total yearly income from the investments was \$2790.
30. Nedra and Latonya Dominguez are 12 miles apart hiking toward each other. How long will it take them to meet if Nedra walks at 3 mph and Latonya walks 1 mph faster?
32. On a 255-mile trip, Gary Alessandrini traveled at an average speed of 70 mph, got a speeding ticket, and then traveled at 60 mph for the remainder of the trip. If the entire trip took 4.5 hours and the speeding ticket stop took 30 minutes, how long did Gary speed before getting stopped?
42. The revenue  $R$  from selling  $x$  number of computer boards is given by  $R = 60x$ , and the cost  $C$  of producing them is given by  $C = 50x + 5000$ . Find how many boards must be sold to break even. Find how much money is needed to produce the break-even number of boards.

## 2.9: Solving Linear Inequalities

Ex: (p 153)

Decide whether the numbers are solutions of the inequality

8.  $x < 6$ ;  $-6, |-6|, 0, -3.2$  \_\_\_\_\_  
10.  $x \geq -3$ ;  $-4, -3, -2, -(-2)$  \_\_\_\_\_

Graph each set of numbers given in interval notation.  
Write an inequality statement in  $x$  describing the numbers graphed.

2.  $(-3, \infty)$   
4.  $(-\infty, 4]$

Graph each inequality on a number line.  
Write the solution in interval notation.

6.  $y < 0$   
8.  $z < -\frac{2}{3}$

## Solve & Graph

12.  $3x > -9$

14.  $x + 4 \leq 1$

16.  $-5x < 20$

18.  $3 - 7x \geq 10 - 8x$

22.  $3x + 9 \leq 5(x - 1)$

24.  $-7x + 4 > 3(4 - x)$

28.  $7(x - 2) + x \leq -4(5 - x) - 12$

30.  $-7x > 21$

34.  $2x - 1 \geq 4x - 5$

38.  $\frac{5}{6}x \cong -8$

44.  $-6x + 2 < -3(x + 4)$

46.  $-5(1 - x) + x \cong -(6 - 2x) + 6$

48.  $-(x - 4) < 4$

54.  $-1 \leq x \leq 4$

58.  $4 \leq 5x - 6 \leq 19$

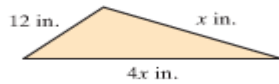
60.  $0 < 4(x + 5) \leq 8$

64.  $-5 \leq 2(x + 4) < 8$

68. Five times a number, increased by one, is less than or equal to ten. Find all such numbers.

70. A surprise retirement party is being planned for Pratep Puri. A total of \$860 has been collected for the event, which is to be held at a local reception hall. This reception hall charges a cleanup fee of \$40 and \$15 per person for drinks and light snacks. Find the greatest number of people that may be invited and still stay within \$860.

72. Find the values for  $x$  so that the perimeter of this triangle is no longer than 87 inches.



74. Alex earns \$600 per month plus 4% of all his sales over \$1000. Find the minimum sales that will allow Alex to earn at least \$3000 per month.

82. Mario Lipco has scores of 85, 95, and 92 on his algebra tests. Use a compound inequality to find the range of scores he can make on his final exam in order to receive an A in the course. The final exam counts as three tests, and an A is received if the final course average is from 90 to 100. (*Hint:* The average of a list of numbers is their sum divided by the number of numbers in the list.)



90. What was the average per person expenditure on newspapers in 2005?

92. What years had per person newspaper expenditures over \$52?

98.  $x^2 - 4x + 8 < x(x + 8)$

