Algebra 2—H

WORD PROBLEMS AND EXTRA PROBLEMS
Sections 3.2 and 3.3

Define variables. Write and solve a system of equations. Write the answer in a complete sentence. (Answers on back!)

1. The difference between two numbers is 4. Twice the larger number is equal to three times the smaller number increased by 2. Find the numbers.

2. For $12, you can buy 4 quarts of milk and 4 cartons of eggs or six quarts of milk and 3 cartons of eggs. Find the cost of a carton of eggs.

3. The perimeter of a rectangle is 28 inches. The length of the rectangle is 1 inch less than twice its width. Find the length and width.

4. Mrs. Bryant spent $48 on 20 boxes of dog treats for Tango and Chopper. Gourmet treats cost $3 per box and store brand treats cost $2 per box. How many boxes of gourmet treats did she buy?

5. John and Harry together weigh 210 pounds. The difference between three times John's weight and twice Harry's weight is 30 pounds. Find both boys' weights.

6. Two isosceles triangles have equal bases. The legs of one isosceles triangle are twice as long as the legs of the other triangle. The perimeters of the triangles are 21 cm and 37 cm. Find the side lengths for the larger triangle.

7. In a canoe race, a team paddles 480 meters downstream in 60 seconds. The same trip makes the trip upstream in 80 seconds. Find the team's rate in still water and the rate of the current.

8. With a head wind a plane traveled 500 km in 5 hours. With a tail wind the plane flew the return trip in 4 hours and 10 minutes. Find the wind speed and the plane's air speed.

9. Together, Alan, Betty, & Chris have $31. Find the amount of money each child has, if Betty has $3 less than Alan, and Chris has $1 more than Alan and Betty combined.

10. A piggy bank contains 30 coins—pennies, nickels, dimes, and quarters—with a total value of $2.37. There are twice as many pennies as nickels and two more dimes than quarters. How many of each kind of coin are there?

Solve each system.

11. $2x-3y=3(x+y-2)$
$3x-2y=2(x+y-3)$

12. $\frac{5x}{4}+y=\frac{11}{2}$
$x+\frac{y}{3}=3$

13. $0.75x+0.3y=4.5$
$0.125x+0.4y=2.6$

Solve each system for x and y.

14. $\frac{6}{x}+\frac{3}{y}=2$
$\frac{2}{x}-\frac{9}{y}=4$

15. $\frac{3}{x}+\frac{8}{y}=1$
$\frac{5}{x}+\frac{4}{y}=1$

16. $\frac{6}{x}+\frac{5}{y}=1$
$\frac{3}{x}-\frac{10}{y}=3$

17. *Determine A and B so that the graph of the equation will contain the given points.*
$y=Ax^2+Bx$; (2, 2), (-3, -18)

18. Write the equation of a line in standard form that contains the point (4, -3) and contains the point of intersection for the lines $2x - 3y = -4$ and $5x + 4y = 13$.

Graph each system in the coordinate plane.

19. $x\geq 0$
$y\geq 0$
$x+y>1$
$4x-y>5$

20. $|x+1|<2$
$|y+2|<1$

Answers:

1. *10 and 6*
2. *$2 per carton*
3. *width = 5 cm, length = 9 cm*
4. *8 boxes*
5. *John weighs 90 lbs; Harry weighs 120 lbs*
6. *16 cm, 16 cm, 5 cm*
7. *team speed = 7 m/s; current = 1 m/s*
8. *air speed = 110 km/hr; wind speed = 10 km/hr*
9. Alan $9, Bev $4, Chris $6, Chris $16
10. *12 pennies, 6 nickels, 7 dimes, 5 quarters*
11. $\left(\frac{-6}{5},\frac{6}{5}\right)$
12. *(2, 3)*
13. *(4, 5)*
14. *(2, -3)*
15. *(7, 14)*
16. *(3, -5)*
17. *A = -1, B = 3*
18. *5x + 3y = 11*