Algebra Workshop

Homework 2

1. Solve the following equations:
   
   (a) \( x^2 = 25 \)  
   (b) \( 2x^2 = 8 \)  
   
   (c) \( x^2 - 5 = 4 \)  
   (d) \( x^2 + 4 = 20 \)  
   
   (e) \( 3x^2 - 1 = 2 \)  
   (f) \( \frac{x^2 - 1}{2} = 12 \)
2. Solve the following equations:

(a) \( \sqrt{x} = 2 \)  
(b) \( \sqrt{x} = 3 \)

(c) \( \sqrt{x} + 1 = 5 \)  
(d) \( \sqrt{x} - 3 = 4 \)

(e) \( \sqrt{x} + 4 = 3 \)  
(f) \( \sqrt{x} - 3 = 5 \)
3. Solve the following equation for $x$:

$$3x + 9y = 6$$

4. Solve the following equation for $y$:

$$\sqrt{x + y} = 5$$
5. You have a box containing a bunch of books. You donate half of the books to the library. Then you give three books to a friend. If the box now contains 21 books, how many books were originally in the box?

6. A university has 80 professors in biology, chemistry, and physics. There are twice as many biology professors as physics professors, and there are 12 more chemistry professors than physics professors. Determine the number of biology professors.
7. Tony has a jar of blue, red, and green marbles. The jar contains 68 marbles. There are twice as many blue marbles as red marbles; there are 12 more green marbles than red marbles. Determine the number of red marbles in the jar.

8. Laura has a bag containing $40.75 in pennies, nickels, dimes, and quarters. There are three times as many pennies as quarters; there are twice as many dimes as quarters; and there are 20 more nickels than quarters. Determine how many pennies, nickels, dimes, and quarters are in the bag.