Solving Equations I

Hints/Guide:

The key in equation solving is to isolate the variable, to get the letter by itself. In two-step equations, we must undo addition and subtraction first, then multiplication and division. Remember the golden rule of equation solving: If we do something to one side of the equation, we must do the exact same thing to the other side. Examples:

1. $4x - 6 = -14$

$+6 \quad +6$

$\frac{4x}{4} = \frac{-8}{4}$

$x = -2$

Solve: $4(-2) - 6 = -14$

$-8 - 6 = -14$

$-14 = -14$

2. $\frac{x}{-6} - 4 = -8$

$+4 \quad +4$

$-6 \cdot \frac{x}{-6} = -4 \cdot -6$

$x = 24$

Solve: $(24/-6) - 4 = -8$

$-4 - 4 = -8$

$-8 = -8$

When solving equations that include basic mathematical operations, we must simplify the mathematics first, then solve the equations. For example:

$5(4 - 3) + 7x = 4(9 - 6)$

$5(1) + 7x = 4(3)$

$5 + 7x = 12$

$-5 \quad -5$

$\frac{7x}{7} = \frac{7}{7}$

$x = 1$

Check: $5(4 - 3) + 7(1) = 4(9 - 6)$

$5 + 7 = 4(3)$

$12 = 12$

Exercises: Solve the following equations using the rules listed on the previous pages:
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $-4t + 3t - 8 = 24$
2. $\frac{m}{-5} + 6 = 4$
3. $-4r + 5 - 6r = -32$
4. $\frac{x}{-3} + (-7) = 6$
5. $6g + (-3) = -12$
6. $\frac{y}{-2} + (-4) = 8$
7. $9 - 5(4 - 3) = -16 + \frac{x}{3}$
8. $6t - 14 - 3t = 8(7 - (-2))$
9. $7(6 - (-8)) = \frac{t}{-4} + 2$
10. $7(3 - 6) = 6(4 + t)$
11. $4r + 5r - 8r = 13 + 6$
12. $3(7 + x) = 5(7 - (-4))$
13. Explain in words how to solve a two step equation, similar to any of the equations in problems 2 through 6 above.