Algebra Review: Factoring

Read the following example problem about Solving by Factoring.

Example $x^2 + 4x - 12$

1) There is no GCF.

2) 1^{st} # * Last #
   1 * -12 = -12

3) 6 * -2 = -12 (product #)
   6 + -2 = 4 (middle #)

4) So then $x^2 + 4x - 12$
   Becomes $x^2 + 6x + -2x - 12$

5) The GCF of $x^2 + 6x$ is x
   The GCF of $-2x - 12$ is -2
   So now our polynomial is
   $x(x + 6) - 2(x + 6)$
   $(x - 2)(x + 6)$

6) $x - 2 = 0$ $x + 6 = 0$
   $x = 2$ $x = -6$

Steps explained here:

1) Look for a GCF in the terms. If there is one, factor it out to the front.
2) Multiply 1^{st} coefficient (the one in front of x^2) and the last number (the plain number) together.
3) Find two numbers that multiply together to equal that product number and add together to equal the number in front of the middle term (the x term).
4) Use those numbers to split up the middle term.
5) Factor by grouping.
   To do this, remember you factor out a GCF from the first two terms, then you factor out a GCF from the last two terms. You create a binomial from the two GCFs * the repeated binomial.
6) To solve, set each binomial equal to zero and solve.

Solve by factoring. Show ALL Work!! Use separate paper, if needed.

1. $m^2 - 3m - 10 = 0$

2. $0 = y^2 - 18y + 45$

3. $n^2 - 6n - 40 = 0$

4. $c^2 + 7c - 30 = 0$

5. $a^2 + 14a + 24 = 0$

6. $0 = 3y^2 + 24y + 45$

7. $6a^2 + 48a - 54 = 0$

8. $5y^2 - 5y - 60 = 0$

9. $3x^2 - 21x - 90 = 0$

10. $c^2 - 3c - 50 = 4$

11. $56 + 3p - p^2 = 2p$

12. $-4a^2 + 3 = -3a^2 + 18a - 60$