A quadratic equation is a equation in the form ax^2+bx+c, where $a \neq 0$ and a and b are real numbers.

Solving Quadratic Equations by Factoring

I. Model Problems

In the following examples you will solve quadratic equations by factoring.

Example 1: **Solve: $x^2 - 3x - 20 = 8$.**

Write down the equation.

Rearrange so the equation is equal to zero ($ax^2 + bx + c = 0$).

$$\begin{array}{rr} x^2 - 3x - 20 & = 8 \\ -8 & -8 \\ \hline x^2 - 3x - 28 & = 0 \end{array}$$

Factor.

$$(x + 4)(x - 7) = 0$$

Apply Zero Product Principle: if the product is zero, either one of the factors or both of the factors equal zero.

Apply additive inverse.

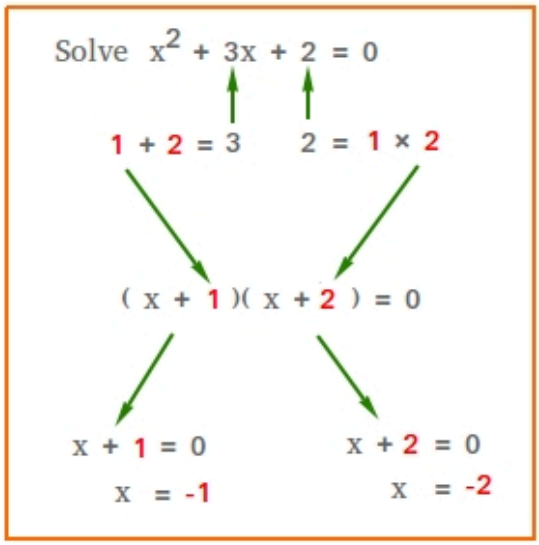
$$\begin{array}{rrrr} (x + 4) & = 0 & (x - 7) & = 0 \\ -4 & -4 & +7 & +7 \\ \hline x & = -4 & x & = 7 \end{array}$$

The solutions are:

$$x = -4, 7$$

Solving quadratic equations by factoring

Solving quadratic equations by factoring could be many times the simplest and quickest way to solve quadratic equations as long as you know how to factor. I strongly recommend that you study or review the following important unit about factoring.



15) $n^2 - 3n - 28 = 0$

$n \quad +4 \quad x-7$

$(x-4)(x+7)$

16) $x^2 + 10x + 24 = 0$

17) $x^2 + 7x - 8 = 0$

$(x+1)(x-8)$

18) $n^2 + 13n + 40 = 0$

n

19) $a^2 - 7a + 10 = 0$

20) $a^2 - 7a + 10 = 0$

21) $m^2 + 2m - 3 = 0$

22) $x^2 + 2x - 15 = 0$

23) $r^2 - r - 20 = 0$

24) $v^2 - 4v - 5 = 0$

25) $p^2 - 9p + 20 = 0$

26) $m^2 - 12m + 32 = 0$

27) $n^2 + 8n + 16 = 0$

28) $p^2 + 4p - 32 = 0$

29) $x^2 - 2x - 35 = 0$

30) $k^2 - k - 6 = 0$