

A quadratic equation is written in the form $ax^2 + bx + c$, Where a, b, and c are real numbers.

Zero Product Property - if the product of two factors is zero, then at least one of the factors is zero.

STEPS TO SOLVE BY FACTORING:

- 1) Rewrite equation so all terms are on one side of equation
- 2) Factor!
- 3) Use Zero Product Property

Ex 1) Solve $x^2 + 8x = 20$ by factoring.

Step 1) Rewrite: $x^2 + 8x - 20 = 0$

Step 2) Factor: $(x + 10)(x - 2) = 0$

Step 3) Use Zero Product Property: $x + 10 = 0$ $x - 2 = 0$
 $x = -10$ $x = 2$ Answer!

Ex 2) Solve $7x^2 + 63x - 70 = 0$.

Step 1) Rewrite: ALREADY IN STANDARD FORM!!!

Step 2) Factor: $7(x^2 + 9x - 10) = 0$
 $7(x + 10)(x - 1) = 0$

Step 3) Use Zero Product Property: $7 \neq 0$ $x + 10 = 0$ $x - 1 = 0$
 $x = -10$ $x = 1$ Answer!

Ex 3) Solve $8x^2 + 18x = 5$.

Step 1) Rewrite: $8x^2 + 18x - 5 = 0$

Step 2) Factor: $(4x - 1)(2x + 5) = 0$

Step 3) Use Zero Product Property: $4x - 1 = 0$ $2x + 5 = 0$
 $x = \frac{1}{4}$ $x = \frac{-5}{2}$ Answer!

Ex 4) Solve $8x^2 - 8 = -x^2 + 56$ by factoring.

Step 1) Rewrite: $8x^2 - 8 + x^2 - 56 = 0$

$9x^2 - 64 = 0$ (difference of squares)

Step 2) Factor: $(3x + 8)(3x - 8) = 0$

Step 3) Use Zero Product Property: $3x + 8 = 0$ $3x - 8 = 0$
 $x = -\frac{8}{3}$ $x = \frac{8}{3}$ Answer!