

Factoring

1. Factor (and Solve)

$$x^2 + 5x + 6 = 0$$

1. All Factorizations of +6

1	6
2	3
-3	-2
-6	-1

2. Line adds to +5 +2, +3

3. $(x+2)(x+3) = 0$

4. $x = -2$ or $x = -3$

2. Factor (and Solve)

$$x^2 - 5x + 6 = 0$$

1. All Factorizations of +6

2. Line adds to -5 -2, -3

3. $(x-2)(x-3) = 0$

4. $x = 2$ or $x = 3$

3. Factor (and Solve)

$$x^2 + 5x - 6 = 0$$

1. All Factorizations of -6

-1	6
-2	3
-3	2
-6	1

2. Line adds to +5 -1, +6

3. $(x+6)(x-1) = 0$

4. $x = -6$ or $x = 1$

4. Factor (and Solve)

$$x^2 - 5x - 6 = 0$$

1. All Factorizations of -6

2. Line adds to -5 -6, +1

3. $(x-6)(x+1) = 0$

4. $x = 6$ or $x = -1$

NOTE: Solve using **quadratic formula** if method fails

1. Method fails if x^2 -Coefficient not 1 . Example $3x^2 - 5x - 6 = 0$

2. If no row works, then doesn't factor nicely

ALSO. If something divides each part, then it divides the whole

Roots and Factors Theorem

ALSO. If $x-a$ is a factor, then a is a root

If $x+a$ is a factor, then $-a$ is a root

And vice versa

5. Factor (and Solve) $10x^2 + 50x + 60 = 0$

1. 10 divides each part. So

2. $10(x^2 + 5x + 6) = 0$

3. $10(x+2)(x+3) = 0$

4. $x = -2$ or $x = -3$

6. Factor (and Solve) $x^3 + 5x^2 + 6x = 0$

1. x divides each part. So

2. $x(x^2 + 5x + 6) = 0$

3. $x(x+2)(x+3) = 0$

4. $x = 0$ or $x = -2$ or $x = -3$