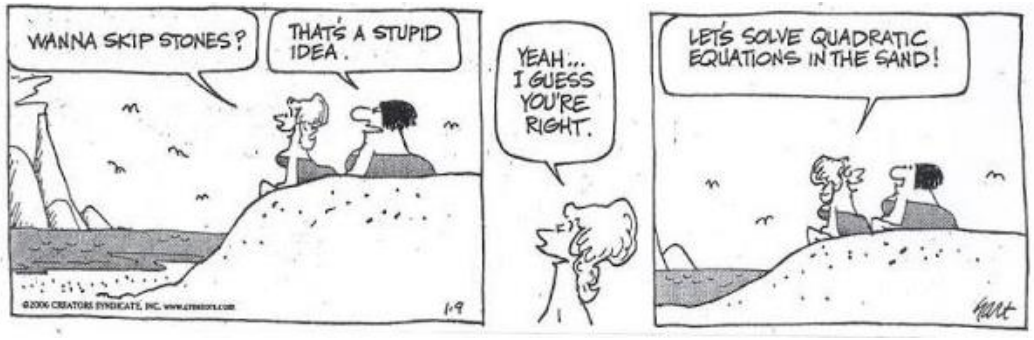

Review of Solving Quadratic Equations:

1. Factoring

1. Get zero on one side.
2. Factor the other side.
3. Set the factors containing the variable equal to zero, and solve.

2. Square root method

$$\text{If } (\text{something})^2 = \text{number}, \text{ then something} = \pm\sqrt{\text{number}}\,.$$

3. Completing the square

If $x^2 + bx = c$, then add $\left(\frac{b}{2}\right)^2$ on both sides to get a perfect square on the left. Finish solving using the square root method.

4. Quadratic formula

$$\text{If } ax^2 + bx + c = 0; a \neq 0, \text{ then } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Factoring examples:

1. $(2x+3)(x-2)=0$

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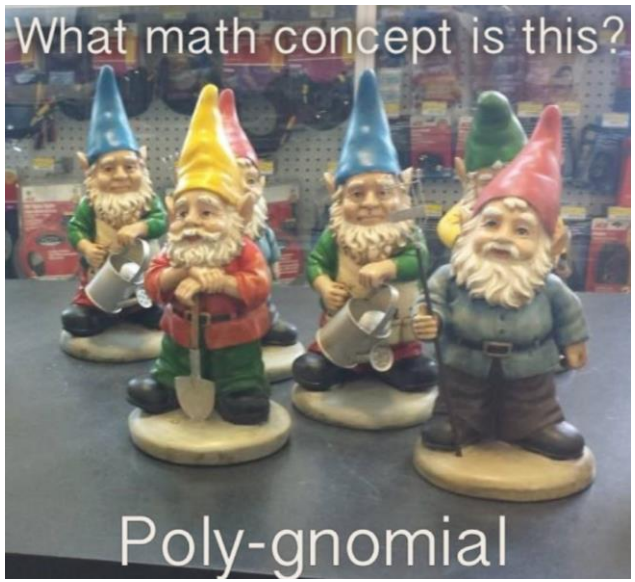
2. $2x^2-6x=0$



3. $x^2+6x=-8$

4. $4x^2+7=16x$

5. $3x^3+x^2-12x-4=0$

Square root method examples:

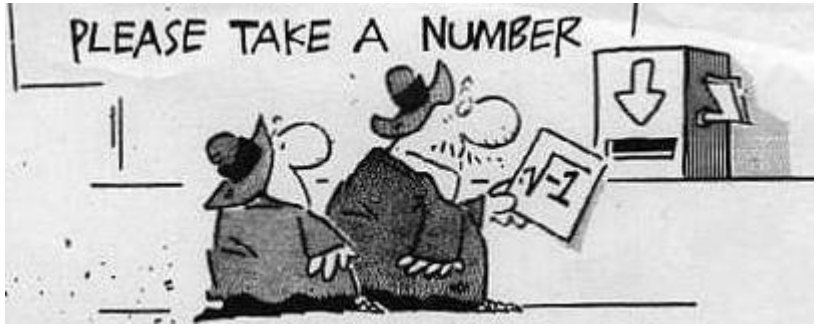
1. $x^2 = 9$

2. $3x^2 = 21$

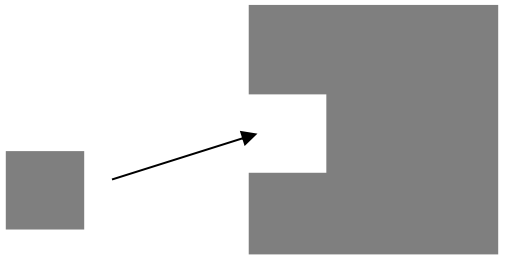
3. $5x^2 = -20$

4. $(x+1)^2 = 8$

5. $(2x-1)^2 = -5$



Completing the square examples:



1. $x^2 + 8x = -15$

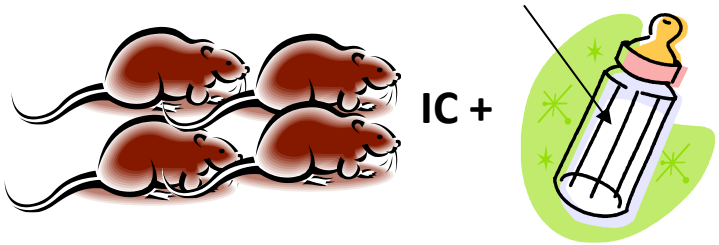
2. $x^2 = 22 + 10x$

3. $x^2 + 6x + 13 = 0$

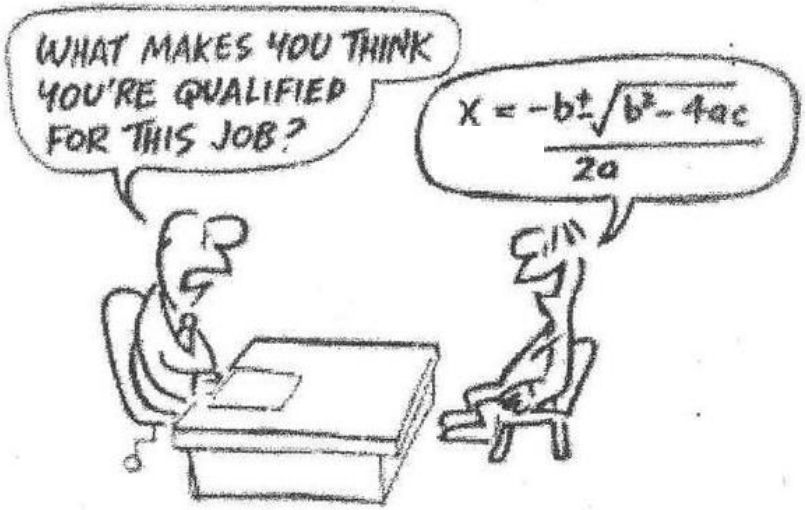
4. $2x^2 - 5x - 3 = 0$

Quadratic formula examples:

1. $x^2 + 4x - 5 = 0$



2. $3x^2 + 8x + 3 = 0$



3. $x^2 + 1 = x$

Quadratic-like equation examples:

1. $x^4 - 3x^2 + 2 = 0$

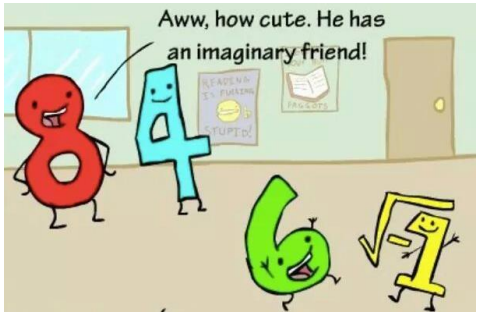
2. $(3x+2)^2 + 7(3x+2) - 8 = 0$

3. $(x^2 - 5x)^2 + (x^2 - 5x) = 12$

The discriminant:

The discriminant of the quadratic equation $ax^2 + bx + c = 0$ is $b^2 - 4ac$.

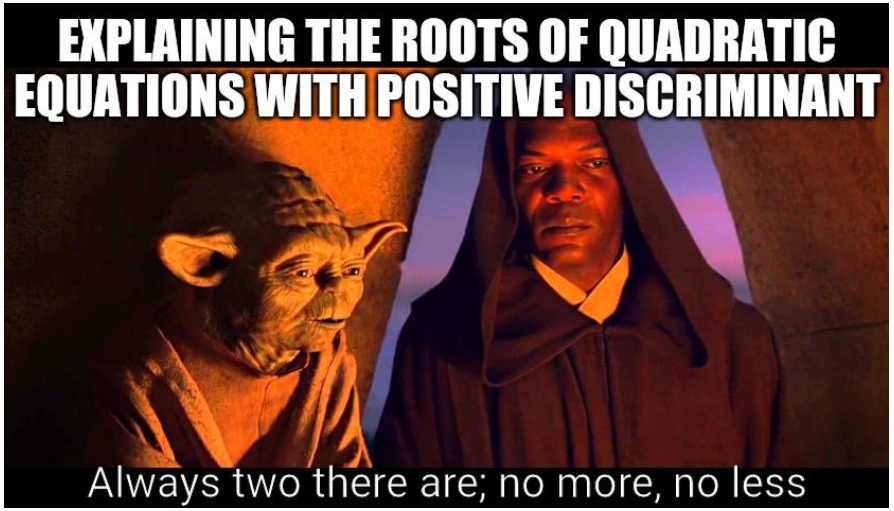
If the quadratic equation has real coefficients, then



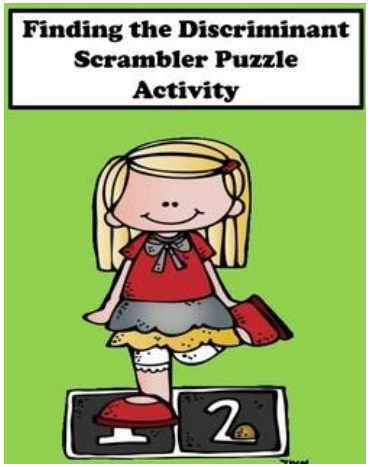
If $b^2 - 4ac > 0$, then the equation has 2 real solutions.

If $b^2 - 4ac < 0$, then the equation has 2 imaginary solutions.

If $b^2 - 4ac = 0$, then the equation has 1 real solution.



Discriminant examples:



1. $4x^2 - 12x + 9 = 0$

2. $x^2 - 2x + 4 = 0$

3. $5x^2 - 4x = 10$