

Your Name

Mrs. Theo

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Notes

Quadratic Formula

Discriminant

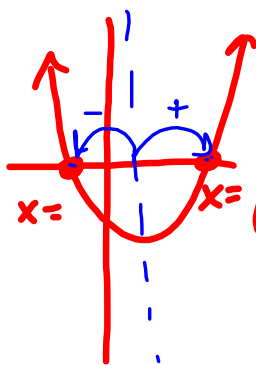


<https://www.youtube.com/watch?v=HB4ws7RoA3M>

Question: If a the goal post in the touchdown zone is 10ft high, how close and how far away could you stand in order to make sure when you kick the ball it will make it over?

Quadratic Formula

When you can't factor or it would take a long time to find the factors, you can ALWAYS find the x-intercept solutions using



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

two Answers

$x =$ and $x =$
 $(x,0)$ and $(x,0)$

The $\pm \sqrt{(b^2 - 4ac)}/2a$ is how much to the left and right of the Axis of Symmetry you go to reach the x-intercept points! *Why?*



1 Rational Root

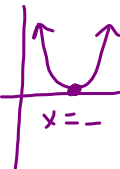
IF $b^2 - 4ac$ IS 0 There is just the $-b/2a$ part, no \pm

ex. $x^2 - 6x + 9 = 0$

$a=1$
 $b=-6$
 $c=9$

$b^2 - 4ac$
 $(-6)^2 - 4(1)(9)$
 $36 - 36$

$x = -$



2 Rational Roots

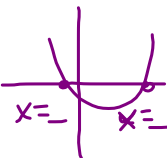
IF $b^2 - 4ac$ IS a perfect square

ex. $2x^2 - 6x + 4 = 0$

$a=2$
 $b=-6$
 $c=4$

$b^2 - 4ac$
 $(-6)^2 - 4(2)(4)$
 $36 - 32$

$x = -$ $x = -$



4 is a perfect square

Discriminant

$b^2 - 4ac$ (The part under the root)

It Discriminates the type of solutions a Quadratic equations has

2 Irrational Roots

IF $b^2 - 4ac$ IS NOT a perfect square

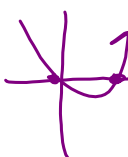
You will be left with a number under the radical

ex. $x^2 - 6x + 7 = 0$

$a=1$
 $b=-6$
 $c=7$

$b^2 - 4ac$
 $(-6)^2 - 4(1)(7)$
 $36 - 28$

8 not a perfect square



2 Imaginary Roots

$b^2 - 4ac$ IS a negative number

The two solutions will imaginary, AND the Graph will not show them.

ex. $x^2 + 16 = 0$ ex. $x^2 - 6x + 10 = 0$

$a=1$
 $b=0$
 $c=16$

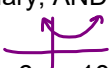
$b^2 - 4ac$
 $(0)^2 - 4(1)(16)$
 $0 - 64$
 -64

$a=1$
 $b=-6$
 $c=10$

$b^2 - 4ac$
 $(-6)^2 - 4(1)(10)$
 $36 - 40$
 -4

Negative -28

So two imaginary solutions



Homework: Use the Discriminant to determine the type and amount of solutions.

1. $x^2 - 49 = 0$
 $a=1$
 $b=0$
 $c=-49$
 $b^2 - 4ac$
 $(0)^2 - 4(1)(-49)$
 $0 + 196$
196 is a perfect square
2 Rational Solutions
2. $x^2 - 5x - 36 = 0$
3. $x^2 - 7x = -3$
4. $2x^2 + 5x + 4 = 0$
5. $2x^2 + 5x - 7 = 0$
6. $n^2 - n - 20 = 0$
7. $3t^2 + 2t - 3 = 0$
8. $1.5p^2 - 9p + 22 = 0$

Homework **KEY**: Use the Discriminant to determine the type and amount of solutions.

1. 2 Rational Solutions:
2. 2 Rational Solutions:
3. 2 Irrational Sol:
4. 2 Imaginary Solutions:
 No real solution
5. 2 Rational Solutions:
6. 2 Imaginary Solutions:
 No real solution
7. 2 Irrational Solutions:
8. 2 Rational Solutions: