

S O L V I N G Q U A D R A T I C S

by

Quadratic Formula

* Occasionally, we discover quadratics that are impossible or very difficult to factor, or very difficult to graph. In these cases, we need to do something else in order to solve the quadratic or find its roots. For these cases, the QUADRATIC FORMULA is most helpful!

* What is the QUADRATIC FORMULA?

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

You were first introduced to solving Quadratics using the Quadratic Formula in Foundations 11

You can determine the nature of the roots for a quadratic equation by examining the value of the *discriminant*.



Discriminant - the expression $b^2 - 4ac$ located under the radical sign in the quadratic formula

When the value of the discriminant is positive
($b^2 - 4ac > 0$) there are 2 real and distinct roots.

When the value of the discriminant is zero
($b^2 - 4ac = 0$) there is one distinct real root

When the value of the discriminant is negative
($b^2 - 4ac < 0$) there are no real roots.

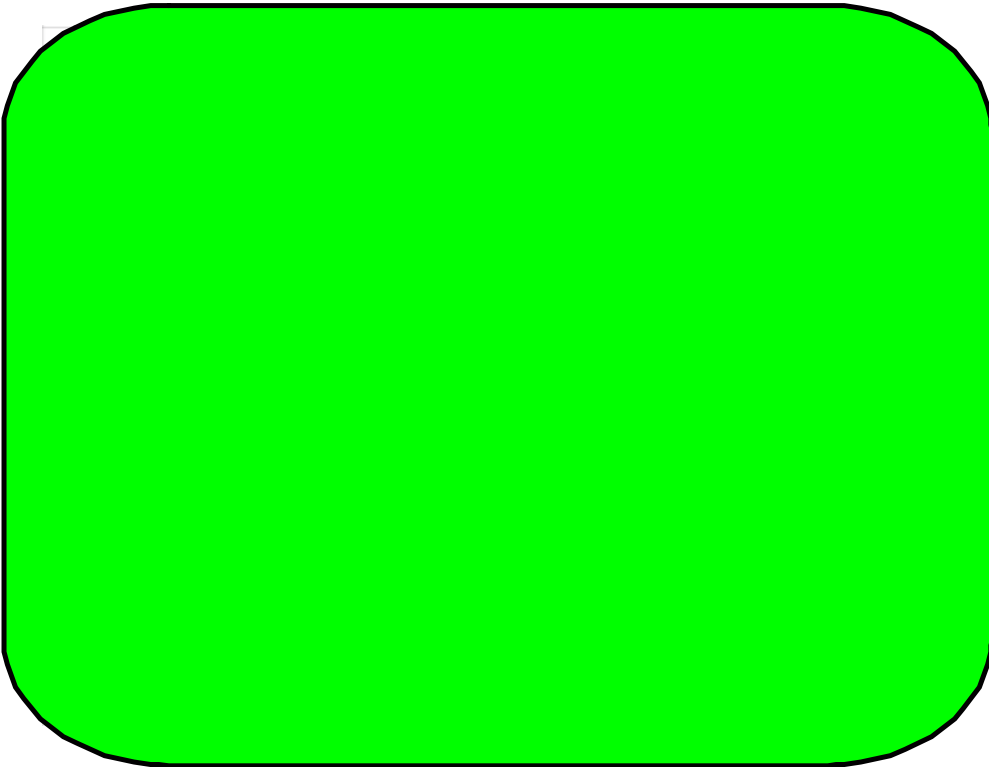
Ex. 1: Determine the nature of the roots for the following:

a) $-2x^2 + 3x + 8 = 0$

b) $3x^2 - 5x = -9$

Ex. 2: Use the quadratic formula to solve the following quadratic equation: $9x^2 + 12x = -4$

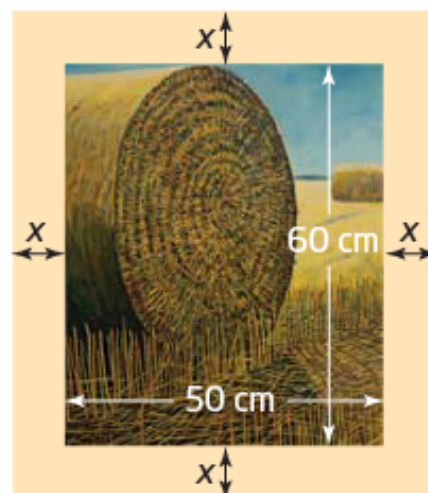
Ex. 3: Solve the following quadratic equation by graphing, factoring, completing the square, and quadratic formula: $6x^2 - 14x + 8 = 0$. Which method do you prefer?



Solving Quadratics by the Quadratic Formula

Ex. 4:

Leah wants to frame an oil original painted on canvas measuring 50 cm by 60 cm. Before framing, she places the painting on a rectangular mat so that a uniform strip of the mat shows on all sides of the painting. The area of the mat is twice the area of the painting. How wide is the strip of exposed mat showing on all sides of the painting, to the nearest tenth of a centimetre?



Attachments

8 Quadratics Formula (song).notebook