

April 9, 2018

Sect. 8-4

Solving Quadratics Using
the Quadratic Formula

Quad. Form.

Discriminant

Types of Solutions

Quad. Formula

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

$$\begin{array}{ccccccc} 2x^2 & + & 3x & - & 7 & = & 0 \\ a & & b & & c & & \end{array}$$

$$2x^2 + 3x - 7 = 0$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(2)(-7)}}{2(2)} = \frac{-3 \pm \sqrt{9 + 56}}{4}$$

$$x = \frac{-3 \pm \sqrt{65}}{4} \xrightarrow{\text{MML}} \frac{-3}{4} \pm \frac{\sqrt{65}}{4}$$

$-\frac{3}{4} + \frac{\sqrt{65}}{4}, -\frac{3}{4} - \frac{\sqrt{65}}{4}$

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

$$a=1 \quad b=-3 \quad c=4$$

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(1)(4)}}{2(1)}$$

$$= \frac{3 \pm \sqrt{9-16}}{2} = \frac{3 \pm \sqrt{-4}}{2}$$

$$= \frac{3 \pm 2i}{2} \xrightarrow{\text{MML}} \frac{3}{2} \pm i \Rightarrow \frac{3}{2} + i, \frac{3}{2} - i$$

Discriminant

$$b^2 - 4ac$$

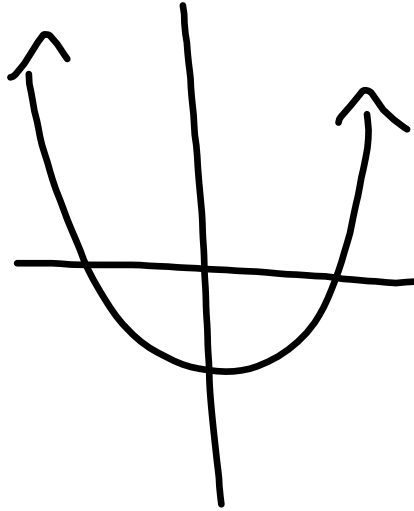
Describes the types of solutions.

If $b^2 - 4ac > 0$, then 2 real solns.

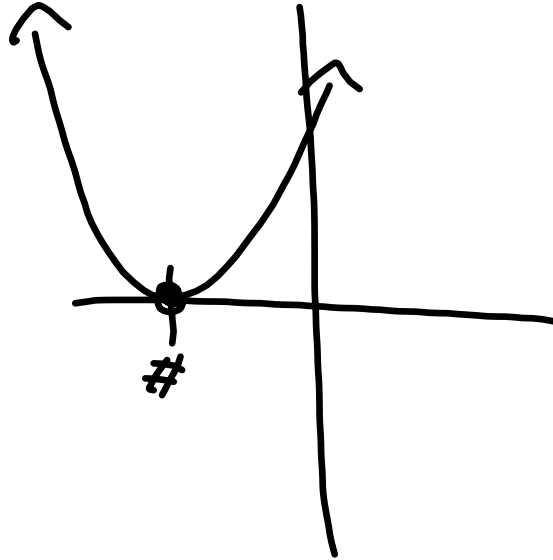
If $b^2 - 4ac < 0$, then 2 complex solns

If $b^2 - 4ac = 0$, then 1 double root

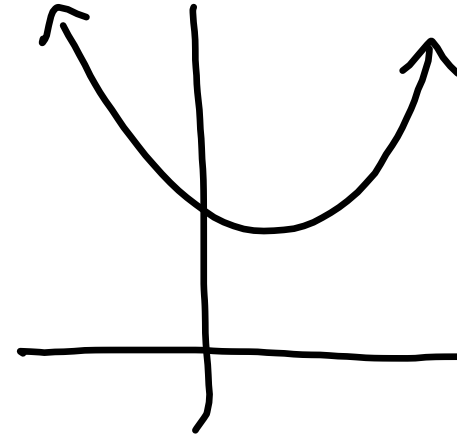
2 real



1 double



2 comp.



Completing won't
work

Use quad. form.