

Lesson 8: Using the quadratic formula to solve quadratics.

Aim: Using the quadratic formula to solve quadratics.

Resources:

- Quadratic formula PowerPoint
- Quadratic formula worksheet
- A pack of cards.

Teacher-led activity (5 - 10 minutes)

Students are to simplify the key aspects of the quadratic formula for the examples on the first slide. The questions appear in this format as opposed to routine number work so that students gain familiarity with simplifying their calculations in the context of using the quadratic formula.

Simplify these calculations:

| | |
|--|----------------------------|
| $\frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-1)}}{2(-1)}$ | $\sqrt{5^2 - 4(-1)(-3)}$ |
| $\frac{-(-5) \pm \sqrt{\quad}}{2(-1)}$ | $\sqrt{(-3)^2 - 4(6)(-1)}$ |

Teacher led activity (5 minutes)

The second slide demonstrates using the quadratic formula to solve $2x^2 - 10x - 8 = 0$, with key questions regarding negative numbers.


Group activity (10 to 15 minutes)

Quadratic Formula

Groups of ...

1. In groups of 3, using your cards in numerical order decide whether your quadratic will have solutions. If it doesn't what in particular made the error?
2. Try to arrange yourselves differently, i.e. so that there are different values for a, b and c so that there are solutions to the quadratic.

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

a  b c

Use the blank spaces to write the value of cards you pick out to serve as an example for the class.

Students are each given a playing card, in groups of three they arrange themselves in numerical order and then assign themselves to a , b and c respectively. In their groups they decide whether their values give solutions to the quadratic equation. If not, they are encouraged to think about what in the formula gave rise to no solutions. Students must then rearrange their values and decide whether this gives solutions to the quadratic equation. The task can be continued and groups can be changed, students will learn that the discriminant is the key to solutions to a quadratic.

Worksheets (30 minutes)

Either use the Quadratic formula worksheet or the solving quadratic equations dot-to-dot. Encourage students to use the quadratic formula and/or factorise. The answer to the dot-to-dot is ORDER.