

## REVISION: QUADRATIC EQUATIONS

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### Lesson Description

In this lesson we revise:

- Solving Quadratic Equations
- Simultaneous Equations
- Nature of Roots
- Quadratic Sequences



### Improve your Skills

## Solving Quadratic Equations

### Question 1

Solve for  $x$ , by completing the square and leaving your answer in simplified surd form:

$$-2x^2 + 12x - 8 = 0$$

### Question 2

Solve for  $x$ :  $2x^3 - 5x^2 - 11x = 0$

## Simultaneous Equations

### Question 3

Solve for  $x$  and  $y$

$$2^x = 4^{y-3} \text{ and } x^2 + y^2 = 20$$

## Nature of Roots

### Question 1

If  $x \in \{0; 1; 2; 3; 4; 5\}$  determine the value(s) of  $x$  for which the expression  $\sqrt{\frac{9}{4-x}}$  is

- Not defined.
- Rational
- Irrational

### Question 2

Without solving the equation, determine the nature of the roots of each of the following equations:

- $x^2 = 5x - 4$
- $(x - 3)(x + 2) = 3x + 6$
- $\frac{4x^2 + 2x + 1}{4x^2 - 2x + 1} = 2$

### Question 3

If  $b^2 - 4ac = 7k^2$  determine the nature of the roots if

- $k = 0$
- $k = \sqrt{7}$

**Question 4**

Calculate the value(s) of  $p$  for which the equation  $2px^2 - 4x + 3 = 0$  has real roots. Hence find one value for  $p$  where the roots will be real and rational.

**Quadratic Sequences****Question 1**

The following sequence of numbers forms a quadratic sequence:

$-2; -3; -6; -11; \dots$

- Determine an expression for the  $n^{\text{th}}$  term of the quadratic sequence.
- Explain why the sequence of numbers will never contain a positive term.

**Question 2**

Determine the formula for the  $n^{\text{th}}$  term of the sequence  $-3; -1; 3; 9 \dots$