# SOLVING QUADRATIC EQUATIONS 17 FEBRUARY 2014

## Lesson Description

In this lesson we:

- Complete the square.
- Solve quadratic equations using factorisation and the quadratic formula

## Summary

### Quadratic Equations

1. In solving quadratic equations (where the polynomial can be factorised), we will make use of the following property:

   If A.B = 0, then A = 0 or B = 0.

2. Quadratic Equations where the polynomial does not factorise;

   Use the quadratic formula if $ax^2 - bx - c = 0$:

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

### Tips for Solving Equations

1. When an equation is NOT linear (that means the highest exponent is not 1), then rewrite the equation in the form of $ax^2 - bx - c = 0$
2. EQUATE TO ZERO, before solving the equation.

## Test Yourself

### Question 1

Choose the correct answer

What is the value of p which makes $x^2 - x + p$ a perfect square?

A. $-\frac{1}{2}$

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $-\frac{1}{4}$

## Question 2

Choose the correct answer

If $3(x-3)=12,$ then $x=\cdots$

A. 1

B. 3

C. 5

D. 7

## Question 3

Choose the correct answer

The difference between the roots of $x^2+x-6=0$ is

A. $-2$

B. $-3$

C. 3

D. $\pm 5$

## Question 4

Choose the correct answer

If $(y-3)(x-2)=0$ and $y=5$ then

A. $x=-2$

B. $x=2$

C. $x=\frac{5}{2}$

D. $x=0$

## Question 5

Choose the correct answer

If $kx^2-5x+k=0$ has 2 as one of its roots, calculate the value of $k$ and its other root.

A. $k=2\ and\ x=\frac{1}{2}$

B. $k=\frac{1}{2}\ and\ x=2$

C. $k=-\frac{1}{2}\ and\ x=-2$

D. $k=\frac{1}{2}\ and\ x=-2$

## Question 6

Choose the correct answer

If $(x-3)(2x+1)=0$ then $2x+1$ has possible values of

A. 0 only

B. $0 \; and \; 3$

C. $0 \; and \; 7$

D. $-\frac{1}{2} \; and \; 3$

## Question 7

Choose the correct answer

Solve for $a$: $(3^a-1)(2^a+4)=0$

A. $a=1 \; or \; a=-2$

B. $a=0$

C. $a=0 \; or \; a=-2$

D. No solution

## Question 8

Choose the correct answer

Solve for $x$: $2x-5x^{\frac{1}{2}}-3=0$

A. $x=9$

B. $x=3$

C. $x=\frac{1}{2}$

D. $x=\frac{1}{9}$

## Question 9

Choose the correct answer

If $p$ is the larger of the roots of $2x^2-3x-7=0$ then $1+3p-2p^2$ is equal to...

A. 3½

B. $-6$

C. $\sqrt{65}$

D. $-\sqrt{47}$

### Question 10

Choose the correct answer

Solve for $x$:

$(3x+2)(x-2) = 2x^2 - 3x + 2$

A. $x = -3 \text{ or } x = 2$

B. $x = -2 \text{ or } x = 3$

C. $x = 2 \text{ or } x = -\frac{2}{3}$

D. $x = 2 \text{ or } x = -\frac{1}{2}$

## Improve your Skills

### 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 $x$: $2x^3 - 5x^2 - 11x = 0$

### Question 3

Solve for *x*.

*Leave your answers in simplified surd form where necessary:*

$(x-4)^2 = k$, where

3.1 k = 0

3.2 k = $-9$

3.3 k = 5