

**APEC-Tsukuba International Conference 2014**  
**Innovation of Mathematics Education through Lesson Study**  
**Tokyo, Japan, 13-16 February 2014**  
**CHENG Chun Chor Litwin**  
**The Hong Kong Institution of Education**

**Lesson Plan for Grade 8 (Secondary 2)**

**Content:** Quadratic equation

**Objective:**

Finding the solution of a quadratic equation  $x^2 + px = q$  by completing the square (integers solutions)

**Knowledge required:**

Understanding of  $x^2 = q^2$  gives  $x = \pm q$ , and the solutions for  $(x + p)^2 = q^2$  is  $x = -p \pm q$

**Introduction Activities**

Could you give me an equation, with solution  $x=3$ ?

Could you give me an equation, with 2 solutions.  $x^2 = 1$  is an example as  $x = 1, x = -1$ .

The solution for  $(x + 2)(x - 1) = 0$  are  $x=-2$ , and  $x = 1$ .

If we are given the equation  $x^2 + x - 2 = 0$  [i.e.  $(x + 2)(x - 1) = 0$  ], can we find  $x=-2$ , and  $x=1$ .

The following are the task used in the lessons

Task 1

If we have a rectangle, with area 55 square unit, and the width is 6 units longer than the length. Find the measurement of the rectangle.

Could we use equation?

Let the length be  $x$ , and the width be  $(x+6)$ , then  $x(x + 6) = 55$

How to get the answer?

Task 2

Can you solve

(i)  $x^2 = 64$ , (ii)  $(x + 3)^2 = 64$  ?

Observe the solution of  $(x + 3)^2 = 64$  and  $x(x + 6) = 55$

Task 3

Can you explain why to think of solving  $(x + 3)^2 = 64$  from  $x^2 + 6x = 55$ .

Task 4

Can we solve similar equations?

Please form a group of 2 persons, and then create a question that you can solve.

Exchange your question with another group and they will solve each other question.