(A) Lesson Objectives

a. Review methods for solving quadratic equations in standard form (square rooting & factoring)
b. Review forms of quadratic equations and state which information can be determined from the equation
c. Present the QF in 2 forms and practice using the QF to solve quadratic equations
d. Present real world applications involving quadratic equations

(B) Solving Quadratic Equations

a. To solve an equation means ➔
b. Quadratic equations can be solved by
   i. ➔
   ii. ➔
c. To make a graphic connection, what are we finding (graphically) when we solve the eqn $0 = ax^2 + bx + c$?

(C) Forms of Quadratic Relations

Forms	(a)	(b)	(c)
Obvious Info			
Info we can calculate			

(D) Non-Factorable Quadratic Equations

Solve $0 = x^2 - 4x - 1$ by factoring	Solve $0 = (x - 2)^2 - 5$ by square roots.	Graph $y = x^2 - 4x - 1$ and $y = (x - 2)^2 - 5$. What do you notice?

(E) Solve by Square Rooting ➔ Method of Completing the Square

FOR INDEPENDENT STUDY: Read through/watch video ➔Example #1, Example #2, Example #3, Example #4, Example #5, Example #6

(F) Quadratic Formula (From the method of completing the square)

The quadratic formula can be used to determine the zeroes of a quadratic (or to solve $0 = ax^2 + bx + c$). The quadratic formula comes in 2 forms:

(a) _____.

(b) _____.

(G)Examples

a. Ex 1: Solve each equation using the quadratic formula. You can verify graphically on the GDC.

$0 = x^2 + 7x + 12 = 0$ $0 = 3x^2 - 6x + 3$ $0 = x^2 - 4x - 1$

$0 = x^2 - 4x + 9$ $3.2w^2 - 8.4 = -28.9w$ $2x^2 = 20 - 3x$

b. Ex 2: For the quadratic equation $y = 2(x - 3)^2 - 11$;

Find the zeroes by using the square root method.	Expand the equation and then find the zeroes using the QF	Which method is easier? Why?

c. The quadratic relation $\boldsymbol{d} = 0.0056\boldsymbol{s}^2 + 0.14\boldsymbol{s}$ models the relationship between a vehicles stopping distance ***d***, in meters, and its speed ***s***, in km/h.

   i. What is the fastest you could drive and still be able to stop within 80m?
   ii. What is the stopping distance for a car travelling at 120 km/hr?
   iii. Estimate the average length of car. How many car lengths does the stopping distance in (b) correspond to?

d. The revenue generated by a dance at school is modelled by the equation $R = -60t^2 + 600t$, where R is the revenue in dollars and t is the ticket price in dollars. To find the PROFIT made from this dance, the equation $P = R - E$ is used, where E represents the expense equation
   i. It was found that the expenses equation was a linear equation, $E = 1000 - 90t$. Calculate the break even price for the tickets.
   ii. Find the maximum profit and the ticket price that earns this profit

e. A motion detector records the height of a baseball, h in meters, t seconds after it is hit into the air. The relation is $h = -4.9t^2 + 20.58t + 0.49$.
   i. From what height was the ball hit?
   ii. For how long was the ball in flight?
   iii. What was the maximum height of the ball?

(H)Homework

From the Nelson 10 textbook, Sec 4.7, p403, Q3, 4acf, 6cegi, 11acfg and Q8,12,13,17 are word problems