YEAR 12 QUADRATIC THEORY

1(a) Solve by **factorising** :

$x^2 + 5x - 14 = 0$

(b) Solve by using the method called "**completing the square**" and show each step clearly.

$x^2 + 8x = 33$

2. **Given** $ax^2 + bx + c = 0$

then $x = \dfrac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Use the quadratic formula to solve these equations and give your solutions to 2 dec pl.

(a) $3x^2 + 9x + 5 = 0$

(b) $5x^2 - 7x - 11 = 0$

3. Show clearly how to solve each of the following 4 equations using the quadratic formula (even though 2 of them factorise)

(a) $x^2 - 8x + 7 = 0$

(b) $x^2 - 8x + 16 = 0$

(c) $x^2 - 8x + 5 = 0$

(d) $x^2 - 8x + 20 = 0$

4. The Discriminant is $\Delta = b^2 - 4ac$.

State what **type** of solutions you get if the discriminant is :

(a) 0

(b) 36

(c) – 9

(d) 3

(e) 1

Use the discriminant in the following questions and show clear reasoning in your working.

5. Find c so that $x^2 - 12x + c = 0$ has 1 rational solution.

6. Find the range of values of p so that $x^2 - 10x + p = 0$ has no real solutions.

7. Find n so that $2x^2 + nx + 8 = 0$ has only one rational solution.

8. Find k so that $x^2 + kx + (k + 3) = 0$ has only one rational solution.

9. Find p so that $x^2 + (p+2)x + (3p - 2) = 0$ has only one rational solution.

10. Find d if $x^2 + (d+3)x + 3d + 1 = 0$ has only one rational solution.

11. Find the range of values of K so that $x^2 - 8x + K = 0$ has no real solutions.

12. Find the range of values of b so that $x^2 + bx + 9 = 0$ has no real solutions.

13. Find the range of values of n so that $x^2 + (n + 2)x + (n + 5) = 0$ has 2 real solutions.

14. Find the range of values of p so that $x^2 + (p - 1)x + p + 2 = 0$ has no real solutions.

15. Find k so that the equation $x^2 + 2(k - 2)x + (k^2 - k - 5) = 0$ has only one rational solution.

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