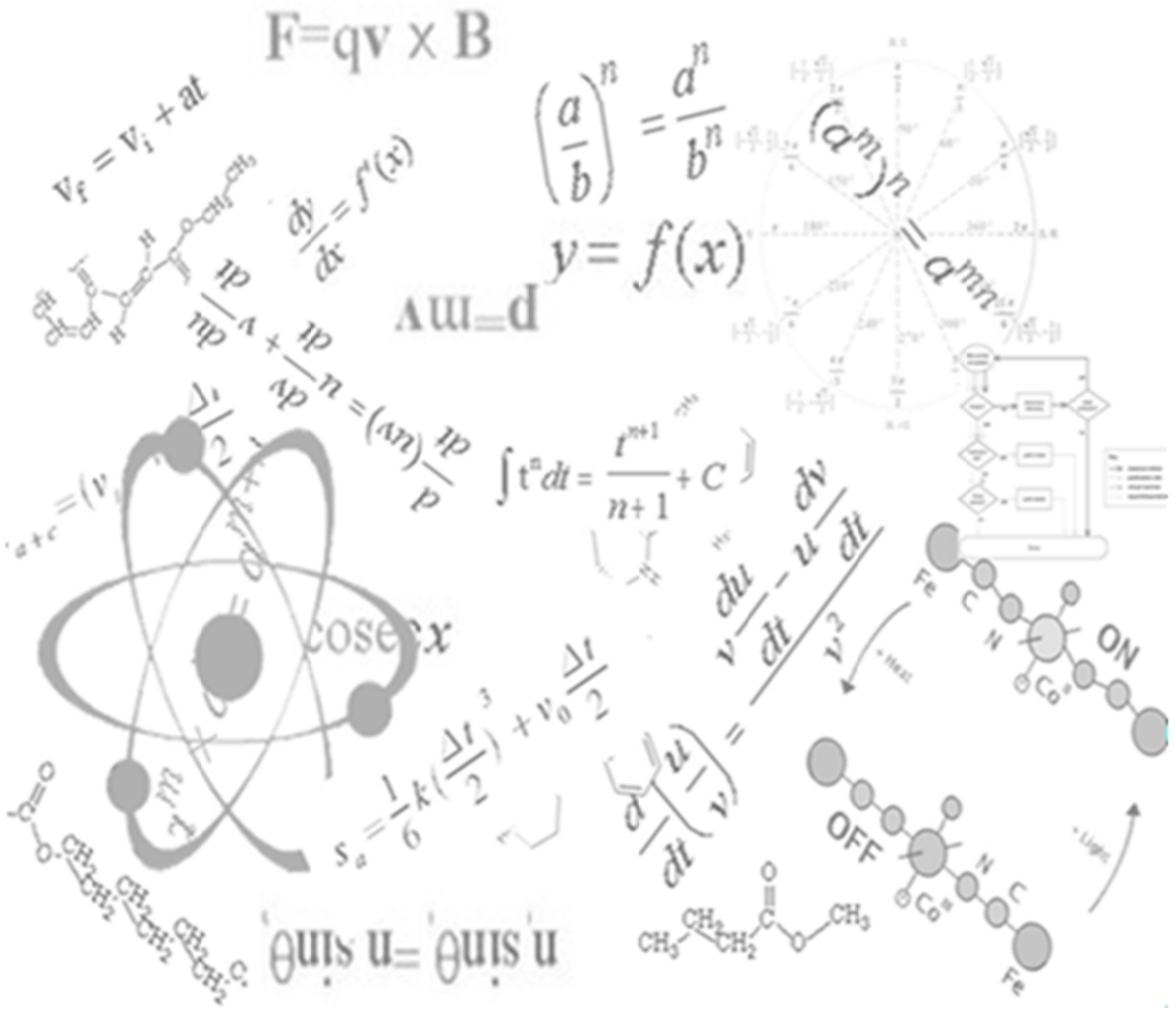


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# Year 11- Mathematics Advanced

## Quadratic polynomial and the parabola



# The Quadratic polynomial and the parabola Exam

## /27

1. (1 marks)

Find the roots of the quadratic equation:  $y = x^2 - x - 6$

2. (2 marks)

Complete the square for  $y = x^2 + 6x + 3$

3. (2 marks)

Find the roots for  $y = x^2 + 5x + 3$

4. (2 marks)

Solve  $x^2 - 5x - 6 > 0$

5. (2 marks)

Consider the equation  $x^2 + (k + 3)x + 25/4 = 0$ . Find the values of  $k$  for which the equation has equal roots.

6. (4 marks)

The equation  $2x^2 - 4x - 5 = 0$  has roots  $\alpha, \beta$ .

i) find  $\alpha + \beta$  and  $\alpha\beta$

ii) find  $\alpha^2 + \beta^2$

iii) find  $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

7. (5 marks)

For the parabola  $x^2 - 4x = 2y - 4$

i) find the vertex

ii) write down the equation of the axis of symmetry

iii) sketch the parabola showing important features.

8. (3 marks)

For the equation  $x^2 + kx - 3x + 2 - k = 0$ , prove that the roots of this are real for all values of  $k$ .

9. (3 marks)

For what values of  $m$  does the equation  $mx^2 + (m + 1)x + 1 = 0$  have distinct roots?

10. (3 marks)

Given the quadratic equation  $x^2 - 5x + 2 = 0$ , find  $(\alpha + 1)(\beta + 1)$