



Quadratics

Questions

Suitable for:

Pearson Edexcel International A-Level (iAL) — Pure Mathematics 1



Question 1

The equation

$$x^2 + (2k + 6)x + 4 = 0$$

where k is a constant, has no real roots.

(a) Show that k satisfies the inequality

$$k^2 + 6k + 5 < 0$$

(3 marks)

(b) Find the range of possible values for k .

(4 marks)

Total for question = 7 marks



Question 2

The equation

$$k(2x^2 + 3x + 6) = 1 - 2x$$

where k is a real constant, has no real roots.

(a) Show that k satisfies the inequality

$$39k^2 - 20k - 4 > 0$$

(4 marks)

(b) Find the range of possible values for k .

(4 marks)

Total for question = 8 marks





Question 3

Find the range of values of k for which the equation

$$kx^2 + 6x + 3(k + 2) = 0$$

has no real roots.

(7 marks)

Total for question = 7 marks





Question 4

The equation

$$kx^2 + 6x + k = 3$$

where k is a constant, has two distinct real solutions for x .

(a) Show that k satisfies

$$k^2 - 3k - 9 < 0$$

(4 marks)

(b) Hence find the set of all possible values of k , giving your boundaries as fully simplified surds.

(3 marks)

Total for question = 7 marks



Question 5

The equation

$$3x^2 + 4px + p = 0$$

where p is a constant, has no real roots.

Find the set of possible values for p .

(5 marks)

Total for question = 5 marks



Question 6

The equation

$$(p + 1)x^2 + 6x + (p + 3) = 0$$

where p is a constant, has no real roots.

(a) Show that p satisfies

$$p^2 + 4p - 6 > 0$$

(3 marks)

(b) Hence find the set of possible values of p , giving your answer in surd form.

(4 marks)

Total for question = 7 marks