Solving quadratics
Difficulty: Easy

Question Paper 1

Level	AS & A Level
Subject	Maths - Pure
Exam Board	Edexcel
Topic	Quadratics
Sub-Topic	Solving quadratics
Difficulty	Easy
Booklet	Question Paper 1

Time allowed: **38 minutes**

Score: **/32**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>76%	61%	52%	42%	33%	23%	<23%

Question 1

Given that the equation $kx^2 + 12x + k = 0$, where k is a positive constant, has equal roots, find the value of k. **(4)**

(Total 4 marks)

Question 2

(a) Find the value of the discriminant of $x^2 + 2x + 3$. Explain how the sign of the discriminant relates to the number of roots of the equation $x^2 + 2x + 3 = 0$. **(2)**

The equation $x^2 + kx + 3 = 0$, where k is a constant, has no real roots.

(b) Find the set of possible values of k, giving your answer in surd form. **(4)**

(Total 6 marks)

Question 3

The equation $2x^2 - 3x - (k + 1) = 0$, where k is a constant, has no real roots.

Find the set of possible values of k. **(4)**

(Total 4 marks)

Question 4

The equation $x^2 + kx + (k + 3) = 0$, where k is a constant, has different real roots.

(a) Show that $k^2 - 4k - 12 > 0$ **(2)**

(b) Find the set of possible values of k. **(4)**

(Total 6 marks)

Question 5

Given that the equation $2qx^2 + qx - 1 = 0$, where q is a constant, has no real roots,

(a) show that $q^2 + 8q < 0$. **(2)**

(b) Hence find the set of possible values of q. **(3)**

(Total 5 marks)

Question 6

The equation $kx^2 + 4x + (5 - k) = 0$, where k is a constant, has 2 different real solutions for x.

(a) Show that k satisfies

$$k^2 - 5k + 4 > 0.$$

(3)

(b) Hence find the set of possible values of k. **(4)**

(Total 7 marks)