

Quadratic and simultaneous equations

AS Pure Mathematics | Edexcel 8MA0 | 12 questions, 53 marks

A-level Maths topic practice



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Name: _____ **Date:** _____ **Score:** _____ / 53

1 Solve the equation $2x^2 - 7x - 15 = 0$ (2 marks)

Answer _____

2 By completing the square, solve $x^2 + 6x - 4 = 0$, giving your answers in the form $a \pm \sqrt{b}$, where a and b are integers. (3 marks)

Answer _____

3 Solve $3x^2 - 5x - 1 = 0$, giving your answers to 3 significant figures. (3 marks)

Answer _____

4 Solve the simultaneous equations
 $y = x + 3$
 $x^2 + y^2 = 29$ (5 marks)

Answer _____

5 Solve the simultaneous equations

$$x + 2y = 7$$

$$x^2 - xy + y^2 = 7$$

You must show all stages of your working.

(6 marks)

Answer _____

6 Using the substitution $u = \sqrt{x}$, or otherwise, solve $x - 7\sqrt{x} + 10 = 0$

(4 marks)

Answer _____

7 Solve the equation $2^{2x} - 9(2^x) + 8 = 0$

(4 marks)

Answer _____

8 The line l has equation $y = 2x + k$, where k is a constant. The curve C has equation $y = x^2 - 4x + 7$

- Show that the x coordinates of any points where l meets C satisfy $x^2 - 6x + (7 - k) = 0$
- Given that l is a tangent to C , find the value of k and the coordinates of the point where l touches C .

(5 marks)

Answer _____

9

Solve $\frac{2}{x-1} + \frac{3}{x+2} = 1$, giving your answers in simplest surd form.

(4 marks)

Answer _____

10

A rectangular allotment plot in Leeds has a perimeter of 46 m. The diagonal of the plot is 17 m long. Find the length and the width of the plot.

(5 marks)

Answer _____

11

Find all the real solutions of the equation $(x^2 - 3x)^2 - 2(x^2 - 3x) - 8 = 0$

(5 marks)

Answer _____

12

Ayesha chips a golf ball up a straight hillside. Relative to the point where the ball is struck, the path of the ball is modelled by

$$y = 2 + 0.8x - 0.05x^2$$

where y m is the height and x m is the horizontal distance. The hillside is modelled by the line $y = 0.2x$

- Find the horizontal distance travelled by the ball before it lands on the hillside. Give your answer to 3 significant figures.
- Show that the vertical height of the ball above the hillside is $h = 2 + 0.6x - 0.05x^2$ metres, and hence find the greatest vertical height of the ball above the hillside.
- Give one limitation of the model.

(7 marks)

Answer

End of questions | Total 53 marks