

ALGEBRA (Q 2 & 3, PAPER 1)

LESSON NO. 3: QUADRATIC EQUATIONS

2007

- 2 (c) (i) Solve the equation $x - \frac{1}{x} = 2$ and write your solutions in the form $a \pm \sqrt{b}$, where $a, b \in \mathbf{N}$.
- (ii) Verify **one** of your solutions.

2006

- 3 (c) Solve for x

$$x = \frac{3+2x}{x-2}, x \neq 2$$

and give your solutions in the form $a \pm \sqrt{b}$, where $a, b \in \mathbf{N}$.

Write one of your solutions correct to two decimal places. Using this value, show that the difference between the values of the left hand side and the right hand side of the given equation is less than 0.1.

2004

- 2 (b) (i) Solve $2x^2 - 7x + 3 = 0$.

(ii) Show that $x - 2$ is a factor of $x^3 - 3x^2 - x + 6$.

2003

- 2 (c) Solve for x the equation

$$\frac{3}{x+1} + \frac{1}{x-1} = 1.$$

Give your answers in the form $a \pm \sqrt{b}$, where $a, b \in \mathbf{N}$.

- 3 (c) (i) Simplify $(x + \sqrt{a-x})(x - \sqrt{a-x})$, where $a - x \geq 0$.

(ii) Given that $x = 3$ is a solution of the equation $(x + \sqrt{a-x})(x - \sqrt{a-x}) = 0$, find the value of a .

(iii) Hence, find the other solution of the equation in part (ii), and verify your answer.

2001

3 (b) (i) Simplify $(x + \sqrt{x})(x - \sqrt{x})$ when $x > 0$.

(ii) Hence, or otherwise, find the value of x for which $(x + \sqrt{x})(x - \sqrt{x}) = 6$.

1999

2 (c) Solve for x

$$\frac{3}{2x-1} = 1 + \frac{2x}{x+2}, \quad x \neq \frac{1}{2} \text{ and } x \neq -2.$$

1998

3 (c) (i) Write $\frac{1}{x+1} + \frac{2}{x-3}$ as a single fraction where $x \neq -1$ and $x \neq 3$.

(ii) Hence, or otherwise, find, correct to one place of decimals, the two solutions of

$$\frac{1}{x+1} + \frac{2}{x-3} = 1, \quad x \neq -1, \quad x \neq 3.$$

1997

2 (c) Simplify

$$\left(\sqrt{x} + \frac{3}{\sqrt{x}}\right)\left(\sqrt{x} - \frac{3}{\sqrt{x}}\right) \text{ where } x > 0.$$

Hence solve for x

$$\left(\sqrt{x} + \frac{3}{\sqrt{x}}\right)\left(\sqrt{x} - \frac{3}{\sqrt{x}}\right) = 8 \text{ where } x > 0.$$

1996

2 (c) Solve

$$\frac{x-1}{x} - \frac{3x}{x-1} = 2, \quad x \neq 0 \text{ and } x \neq 1.$$

ANSWERS

2007 2 (c) (i) $x = 1 \pm \sqrt{2}$

2006 3 (c) $2 \pm \sqrt{7}$; $4 \cdot 65$, $-0 \cdot 65$

2004 2 (b) (i) $x = \frac{1}{2}, 3$

2003 2 (c) $2 \pm \sqrt{3}$

3 (c) (i) $x^2 + x - a$ (ii) $a = 12$ (iii) $x = -4$

2001 2 (b) (i) $x^2 - x$ (ii) $x = -2, 3$

1999 2 (c) $x = -1, \frac{4}{3}$

1998 3 (c) (i) $\frac{3x-1}{(x+1)(x-3)}$ (ii) $x = -0 \cdot 4, 5 \cdot 4$

1997 2 (c) $x - \frac{2}{x}$; $x = -1, 9$

1996 2 (c) $x = -\frac{1}{2}, \frac{1}{2}$