REVISE THIS
TOPIC

1 By completing the square, solve the equation $x^2 - 4x + 1 = 0$
Give your answers in the form $a \pm \sqrt{3}$, where a is an integer.
You must show all your working.

$$(x-2)^2 - 3 = 0$$
$$(x-2)^2 = 3$$
$$x - 2 = \pm\sqrt{3}$$
$$x = 2 \pm \sqrt{3}$$

$$x = 2 + \sqrt{3} \qquad x = 2 - \sqrt{3}$$

(Total for Question 1 is 4 marks)

2 By completing the square, solve the equation $x^2 - 10x + 19 = 0$
Give your answers in the form $a \pm \sqrt{6}$, where a is an integer.
You must show all your working.

$$(x-5)^2 - 6 = 0$$
$$(x-5)^2 = 6$$
$$x - 5 = \pm\sqrt{6}$$
$$x = 5 \pm \sqrt{6}$$

$$x = 5 + \sqrt{6} \qquad x = 5 - \sqrt{6}$$

(Total for Question 2 is 4 marks)

1st

1

3 By completing the square, solve the equation $x^2 + 6x - 1 = 0$
Give your answers in the form $a \pm \sqrt{10}$, where a is an integer.
You must show all your working.

$$(x+3)^2 - 10 = 0$$
$$(x+3)^2 = 10$$
$$x + 3 = \pm\sqrt{10}$$
$$x = -3 \pm \sqrt{10}$$

$$x = -3 + \sqrt{10} \qquad x = -3 - \sqrt{10}$$

(Total for Question 3 is 4 marks)

4 By completing the square, solve the equation $x^2 - 2x - 4 = 0$
Give your answers in the form $a \pm \sqrt{5}$, where a is an integer.
You must show all your working.

$$(x-1)^2 - 5 = 0$$
$$(x-1)^2 = 5$$
$$x - 1 = \pm\sqrt{5}$$
$$x = 1 \pm \sqrt{5}$$

$$x = 1 + \sqrt{5} \qquad x = 1 - \sqrt{5}$$

(Total for Question 4 is 4 marks)

5 By completing the square, solve the equation $x^2 + 20x + 93 = 0$
Give your answers in the form $a \pm \sqrt{7}$, where a is an integer.
You must show all your working.

$$(x+10)^2 - 7 = 0$$
$$(x+10)^2 = 7$$
$$x + 10 = \pm\sqrt{7}$$
$$x = -10 \pm \sqrt{7}$$

$$x = -10 + \sqrt{7} \qquad x = -10 - \sqrt{7}$$

(Total for Question 5 is 4 marks)

2

6 By completing the square, solve the equation $x^2 - 4x - 4 = 0$
Give your answers in the form $a \pm b\sqrt{2}$, where a and b are integers.
You must show all your working.

$$(x-2)^2 - 8 = 0$$
$$(x-2)^2 = 8$$
$$x-2 = \pm\sqrt{8}$$
$$x = 2 \pm \sqrt{8}$$

$$\sqrt{8} = \sqrt{4} \times \sqrt{2}$$
$$= 2\sqrt{2}$$

$$x = 2 + 2\sqrt{2} \qquad x = 2 - 2\sqrt{2}$$

(Total for Question 6 is 4 marks)

7 By completing the square, solve the equation $x^2 - 10x - 50 = 0$
Give your answers in the form $a \pm b\sqrt{3}$, where a and b are integers.
You must show all your working.

$$(x-5)^2 - 75 = 0$$
$$(x-5)^2 = 75$$
$$x-5 = \pm\sqrt{75}$$
$$x = 5 \pm \sqrt{75}$$

$$\sqrt{75} = \sqrt{25} \times \sqrt{5}$$
$$= 5\sqrt{5}$$

$$x = 5 + 5\sqrt{3} \qquad x = 5 - 5\sqrt{3}$$

(Total for Question 7 is 4 marks)

8 By completing the square, solve the equation $x^2 - 16x - 26 = 0$
Give your answers in the form $a \pm b\sqrt{10}$, where a and b are integers.
You must show all your working.

$$(x-8)^2 - 90 = 0$$
$$(x-8)^2 = 90$$
$$x-8 = \pm\sqrt{90}$$
$$x = 8 \pm \sqrt{90}$$

$$\sqrt{90} = \sqrt{9} \times \sqrt{10}$$
$$= 3\sqrt{10}$$

$$x = 8 + 3\sqrt{10} \qquad x = 8 - 3\sqrt{10}$$

(Total for Question 8 is 4 marks)

3

9 By completing the square, solve the equation $x^2 + 15x + 21 = 3x - 9$
Give your answers in the form $a \pm \sqrt{6}$, where a is an integer.
You must show all your working.

$$x^2 + 12x + 30 = 0$$
$$(x+6)^2 - 6 = 0$$
$$(x+6)^2 = 6$$
$$x + 6 = \pm\sqrt{6}$$

$$x = -6 \pm \sqrt{6}$$

$$x = -6 + \sqrt{6} \qquad x = -6 - \sqrt{6}$$

(Total for Question 9 is 5 marks)

10 By completing the square, solve the equation $x^2 - 6x + 4 = 5 - 2x$
Give your answers in the form $a \pm \sqrt{5}$, where a is an integer.
You must show all your working.

$$x^2 - 4x - 1 = 0$$
$$(x-2)^2 - 5 = 0$$
$$(x-2)^2 = 5$$
$$x - 2 = \pm\sqrt{5}$$

$$x = 2 \pm \sqrt{5}$$

$$x = 2 + \sqrt{5} \qquad x = 2 - \sqrt{5}$$

(Total for Question 10 is 5 marks)

11 By completing the square, solve the equation $x^2 + 3x + 7 = 9x + 6$
Give your answers in the form $a \pm b\sqrt{2}$, where a and b are integers.
You must show all your working.

$$x^2 - 6x + 1 = 0$$
$$(x-3)^2 - 8 = 0$$
$$(x-3)^2 = 8$$
$$x - 3 = \pm\sqrt{8}$$

$$x = 3 \pm \sqrt{8}$$
$$\sqrt{8} = \sqrt{4} \times \sqrt{2}$$
$$= 2\sqrt{2}$$

$$x = 3 + 2\sqrt{2} \qquad x = 3 - 2\sqrt{2}$$

(Total for Question 11 is 5 marks)

1st

4