Quadratic Equations

Recap on Factorising

Ex1
$$x^2 + 11x + 24$$
$$(x + 3)(x + 8)$$

+1	+24
-1	-24
+2	+12
-2	-12
+3	+8 ✓
-3	-8
+4	+6
-4	-6

Ex2
$$x^2 - 5x + 6$$
$$= (x - 2)(x - 3)$$

+1	+6
-1	-6
+2	+3
-2	-3 ✓

Ex3
$$x^2 - 2x - 15$$
$$= (x + 3)(x - 5)$$

+1	-15
-1	+15
+3	-5 ✓
-3	+5

Ex4
$$x^2 + 4x - 21$$
$$= (x - 3)(x + 7)$$

+1	-21
-1	+21
+3	-7
-3	+7 ✓

Exercise

1)
$$x^2 + 11x + 10$$
$$= (x + 1)(x + 10)$$

+1	+10 ✓
-1	-10
+2	+5
-2	-5

2)
$$x^2 - 6x + 8$$
$$= (x - 2)(x - 4)$$

+1	+8
-1	-8
+2	+4
-2	-4 ✓

3)
$$x^2 - 3x - 10$$
$$= (x + 2)(x - 5)$$

+1	-10
-1	+10
+2	-5 ✓
-2	+5

4)
$$x^2 + 6x - 7$$
$$= (x - 1)(x + 7)$$

+1	-7
-1	+7 ✓

5)
$$x^2 + 3x + 2$$
$$= (x + 1)(x + 2)$$

+1	+2 ✓
-1	-2

6)
$$x^2 - 5x + 4$$
$$= (x - 1)(x - 4)$$

+1	+4
-1	-4 ✓
+2	+2
-2	-2

7)
$$x^2 - 4x - 12$$
$$= (x + 2)(x - 6)$$

+1	-12
-1	+12
+2	-6 ✓

8)
$$x^2 + 7x - 8$$
$$= (x - 1)(x + 8)$$

+1	-8
-1	+8 ✓

Quadratic Equations

Ex 1

$$x^2 - 5x + 6 = 0$$
$$(x-2)(x-3) = 0$$

Either $\quad x - 2 = 0 \quad$ or $\quad x - 3 = 0$

$$\underline{x = 2} \qquad\qquad \underline{x = 3}$$

Ex 2

$$x^2 - 3x - 10 = 0$$
$$= (x+2)(x-5) = 0$$

Either $\quad x + 2 = 0 \quad$ or $\quad x - 5 = 0$

$$\underline{x = -2} \qquad\qquad \underline{x = 5}$$

Ex 3

$$x^2 + 5x + 4 = 0$$
$$(x+1)(x+4) = 0$$

Either $\quad x + 1 = 0 \quad$ or $\quad x + 4 = 0$

$$\underline{x = -1} \qquad\qquad \underline{x = -4}$$

Ex 4

$$x^2 - 20x - 21 = 0$$
$$(x+1)(x-21) = 0$$

Either $\quad x + 1 = 0 \quad$ or $\quad x - 21 = 0$

$$x = -1 \qquad\qquad x = 21$$

Exercise   Solve

1)
$$x^2 - 6x + 5 = 0$$
$$(x - 1)(x - 5) = 0$$

Either $x - 1 = 0$ or $x - 5 = 0$
$$x = 1 \qquad\qquad x = 5$$

$+1 \quad +5$
$-1 \quad -5\checkmark$

2)
$$x^2 - 3x - 4 = 0$$
$$= (x + 1)(x - 4) = 0$$

Either $x + 1 = 0$ or $x - 4 = 0$
$$x = -1 \qquad\qquad x = 4$$

$+1 \quad -4\checkmark$
$-1 \quad +4$

3)
$$x^2 + 9x - 10 = 0$$
$$= (x - 1)(x + 10) = 0$$

Either $x - 1 = 0$ or $x + 10 = 0$
$$x = 1 \qquad\qquad x = -10$$

$+1 \quad -10$
$-1 \quad +10$

4)
$$x^2 - 7x + 6 = 0$$
$$= (x - 1)(x - 6) = 0$$

Either $x - 1 = 0$ or $x - 6 = 0$
$$x = 1 \qquad\qquad x = 6$$

$+1 \quad +6$
$-1 \quad -6\checkmark$
$+2 \quad +3$
$-2 \quad -3$

5)
$$x^2 - 6x + 8 = 0$$
$$(x - 2)(x - 4) = 0$$

Either $x - 2 = 0$ or $x - 4 = 0$
$$x = 2 \qquad\qquad x = 4$$

6)
$$x^2 + x - 2 = 0$$

$$(x-1)(x+2) = 0 \qquad \begin{array}{cc} +1 & -2 \\ -1 & +2 \checkmark \end{array}$$

Either $x-1=0$ or $x+2=0$

$$\underline{x=1} \qquad \underline{x=-2}$$

7)

$$x^2 - 6x + 5 = 0 \qquad \begin{array}{cc} +1 & +5 \\ -1 & -5 \end{array}$$

$$(x-1)(x-5) = 0$$

Either $x-1=0$ or $x-5=0$

$$\underline{x=1} \qquad \underline{x=5}$$

8)

$$x^2 - 11x + 24 = 0 \qquad \begin{array}{cc} +1 & +24 \\ -1 & -24 \\ +2 & +12 \\ -2 & -12 \\ +3 & +8 \\ -3 & -8 \checkmark \end{array}$$

$$(x-3)(x-8) = 0$$

Either $x-3=0$ or $x-8=0$

$$\underline{x=3} \qquad \underline{x=8}$$