Quadratic Equations Review

Ex 1

$$x^2 + 5x + 6 = 0$$

$$(x+2)(x+3) = 0$$

+1	+6
−1	−6
+2	+3 ✓
−2	−3

Either $x + 2 = 0$ or $x + 3 = 0$

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

Ex 2

$$x^2 - 7x + 12 = 0$$

$$(x-3)(x-4) = 0$$

+1	+12
−1	−12
+2	+6
−2	−6
+3	+4 ✓
−3	−4

Either $x - 3 = 0$ or $x - 4 = 0$

$\underline{x = 3}$ $\underline{x = 4}$

Ex 3

$$x^2 + x - 20 = 0$$

$$(x-4)(x+5) = 0$$

+1	−20
−1	+20
+2	−10
−2	+10
+4	−5 ✓
−4	+5

Either $x - 4 = 0$ or $x + 5 = 0$

$\underline{x = 4}$ $\underline{x = -5}$

Ex 4

$$x^2 - 3x - 10 = 0$$

$$(x+2)(x-5) = 0$$

+1	−10
−1	+10
+2	−5 ✓
−2	+5

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

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

Exercise Solve

1) $x^2 + 9x + 14 = 0$

$(x+2)(x+7) = 0$

$x+2=0$ or $x+7=0$

$\underline{x=-2}$ $\underline{x=-7}$

2) $x^2 - 3x + 2 = 0$

$(x-2)(x-1) = 0$

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

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

3) $x^2 - 2x - 24 = 0$

$(x+4)(x-6) = 0$

$x+4=0$ $x-6=0$

$\underline{x=-4}$ $\underline{x=6}$

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

$(x-1)(x+6) = 0$

$x-1=0$ or $x+6=0$

$\underline{x=1}$ $\underline{x=-6}$

5) $x^2 + 8x + 12 = 0$

$(x+2)(x+6) = 0$

$x+2=0$ or $x+6=0$

$\underline{x=-2}$ $\underline{x=-6}$

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

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

$x-1=0$ or $x-1=0$

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

Ex5 $x^2 - 7x = 0$

$x(x-7) = 0$

$x=0$ or $x-7=0$

$x=7$

Ex6 $3x^2 + 5x = 0$

$x(3x+5) = 0$

$x=0$ or $3x+5=0$

$3x=-5$

$x=-\frac{5}{3}$

Exercise

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

$x(x+4) = 0$

$\underline{x=0}$ or $x+4=0$

$\underline{x=-4}$

2) $2x^2 - 3x = 0$

$x(2x-3) = 0$

$\underline{x=0}$ or $2x-3=0$

$2x=3$

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

Quadratic Formula

to solve $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Ex 1

$$2x^2 - 3x - 7 = 0$$

$a = 2$
$b = -3$
$c = -7$

$$x = \frac{+3 \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{+3 \pm \sqrt{9 + 56}}{4}$$

$$x = \frac{+3 + \sqrt{65}}{4} \quad \text{or} \quad x = \frac{+3 - \sqrt{65}}{4}$$

$$\underline{x = 2.77} \qquad \underline{x = -1.27}$$

Exercise

1)

$$3x^2 + 10x + 4 = 0$$

$a = 3$
$b = 10$
$c = 4$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-10 \pm \sqrt{10^2 - 4(3)(4)}}{2(3)} = \frac{-10 \pm \sqrt{100 - 48}}{6}$$

$$x = \frac{-10 + \sqrt{52}}{6} \quad \text{or} \quad x = \frac{-10 - \sqrt{52}}{6}$$

$$\underline{x = -0.465} \qquad \underline{x = -2.87}$$