

EXERCISE 8 404

$$(i) \quad 2x^2 - 3x + 5 = 0$$

$$a = 2 \quad b = -3 \quad c = 5$$

$$\begin{aligned} D &= b^2 - 4ac \\ &= (-3)^2 - 4(2)(5) \\ &= 9 - 40 \\ &= -31 \end{aligned}$$

$$\text{So } D < 0$$

So it is not real root.

$$(ii) \quad 2x^2 + x - 4 = 0$$

$$a = 2 \quad b = 1 \quad c = -4$$

$$\begin{aligned} D &= b^2 - 4ac \\ &= (1)^2 - 4(2)(-4) \\ &= 1 - 32 \\ &= -31 \end{aligned}$$

$$D < 0$$

So it has no real root

$$(iii) \quad 3x^2 - 4\sqrt{3}x + 4 = 0$$

$$a = 3 \quad b = -4\sqrt{3} \quad c = 4$$

$$\begin{aligned} D &= b^2 - 4ac \\ &= (-4\sqrt{3})^2 - 4(3)(4) \\ &= 48 - 48 \\ &= 0 \end{aligned}$$

$$D = 0$$

So it has the real root

$$2(i) \quad 2x^2 + kx + 3 = 0$$

$$a = 2 \quad b = k \quad c = 3$$

$$\begin{aligned} D &= b^2 - 4ac \\ &= (k)^2 - 4(2)(3) \\ &= k^2 - 24 \end{aligned}$$

$$\Rightarrow k = 24$$

$$(ii) \quad kx(x - 2) + 6 = 0$$

$$\Rightarrow kx^2 - 2kx + 6 = 0$$

$$a = k \quad b = -2k \quad c = 6$$

$$\begin{aligned} D &= b^2 - 4ac \\ &= (-2k)^2 - 4(k)(6) \\ &= 4k^2 - 24k \end{aligned}$$

$$= 4k(k - 6) = 0$$

$$k = 6 \quad \text{and} \quad k = 0$$

B Let breadth be = x

Let length be = $2x$

Area = 800m^2

$\Rightarrow l \times b = 800$

$\Rightarrow (2x)(x) = 800$

$\Rightarrow 2x^2 = 800$

$\Rightarrow x^2 = 400$

$\Rightarrow x = 20\text{m}$

$l = 2x = 2(20) = 40\text{m}$

4 Let one friend age = x

Let another friend = $16 - x$

Before 4 yrs.

$(x - 4)(16 - x) = 48$

$\Rightarrow (x)(16 - x) - (4)(16 - x) = 48$

$\Rightarrow 16x - x^2 - 64 + 4x = 48$

$\Rightarrow -x^2 + 20x - 112 = 0$

$\Rightarrow x^2 - 20x + 112 = 0$

$a = 1 \quad b = -20 \quad c = 112$

$D = b^2 - 4ac$

$= (-20)^2 - 4(1)(112)$

$= 400 - 448$

$= -48$

$D < 0$ no real root.

$$5) \quad 2(l + b) = 80 \text{ m}$$

$$\Rightarrow l + b = 40 \text{ m}$$

$$80 \quad l = x$$

$$b = 40 - x$$

ATQ

$$(x)(40 - x) = 400$$

$$\Rightarrow 40x - x^2 = 400$$

$$\Rightarrow 40x - x^2 - 400 = 0$$

$$\Rightarrow x^2 - 40x + 400$$

$$\Rightarrow x^2 - 20x - 20x + 400$$

$$\Rightarrow x(x - 20) - 20(x - 20)$$

$$\Rightarrow (x - 20)(x - 20)$$

$$\Rightarrow x = 20$$

$$\text{and } 40 - x = 40 - 20 = 20$$