$$\underline{Ex-4.4}$$

li) $2x^2 - 3x + 5 = 0$

$a = 2, b = -3, c = 5$

$D = b^2 - 4ac$

$= (-3)^2 - 4(2)(5)$

$= 9 - 40 = -31 < 0$

Roots are imaginary.

ii) $3x^2 - 4\sqrt{3}x + 4 = 0$

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

$D = b^2 - 4ac$

$= (-4\sqrt{3})^2 - 4 \times 3 \times 4$

$= 48 - 48 = 0$

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

$= x = \dfrac{(-4\sqrt{3}) \pm \sqrt{(-4\sqrt{3})^2 - 4 \times 3 \times 4}}{2 \times 3}$

$= \dfrac{4\sqrt{3} \pm \sqrt{48 - 48}}{6} = \dfrac{4\sqrt{3}}{6} = \dfrac{2}{\sqrt{3}}$

iii) $2x^2 - 6x + 3 = 0$

$a = 2, b = -6, c = 3$

$D = b^2 - 4ac$

$= (-6)^2 - 4 \times 2 \times 3$

$= 36 - 24 = 12 > 0$

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

$x = \dfrac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(3)}}{2 \times 2}$

$= \dfrac{6 \pm \sqrt{36 - 24}}{4}$

$= \dfrac{6 \pm \sqrt{12}}{4} = \dfrac{3 \pm \sqrt{3}}{2}$

$x = \dfrac{3 + \sqrt{3}}{2}$ or $x = \dfrac{3 + \sqrt{3}}{2}$

2i) $2x^2 + kx + 3 = 0$

$ax^2 + bx + c = 0$

$a = 2, b = k$ and $c = 3$

$D = b^2 - 4ac$

$$= k^2 - 4 \times 2 \times 3 = k^2 - 24$$

$$D = 0$$

$$k^2 - 24 = 0$$

$$k^2 = 24 \quad \text{or} \quad k = \pm \sqrt{24}$$

$$k = \pm \sqrt{4 \times 6} = \pm 2\sqrt{6}$$

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

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

$$ax^2 + bx + C = 0$$

$$a = k, \quad b = -2k \quad \text{and} \quad c = 6$$

$$D = b^2 - 4ac$$

$$= (-2k)^2 - 4 \times k \times 6 = 4k^2 - 24k$$

$$D = 0$$

$$4k^2 - 24k = 0$$

$\Rightarrow \quad k(4k - 24) = 0$

$$k = 0 \quad (\text{not possible})$$

$$4k - 24 = 0$$

$4k = 24$

$k = \dfrac{24}{4} = 6$

3)   Length × Breadth = Area

→ $x \times 2x = 800$

⇒ $2x^2 = 800$

⇒ $x^2 = 400 = (20)^2$

⇒ $x = 20$

1)   Let the present age of one friend be x years

The present age of other friend be $(20-x)$ years

4 years ago, one friend's age was ~~(✗✗✗✗✗)~~ ~~(✗✗✗)~~ ~~years~~.

$(x-4)$ years

4 years ago, other friend's age was =

$(20-x-4) = (16-x)$ yea

ATQ,

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

Scanned by TapScanner

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

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

$ax^2 + bx + c = 0$

$a = 1, b = -20 \ \& \ c = 112$

$D = b^2 - 4ac$

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

$= 400 - 448 = -48 < 0$

Roots not exist.

5) Let the length of rectangular park be x

Perimeter of rectangular park = $2(Length + Breadth)$

$= \quad 2(x + Breadth) = 80$

$= \quad Broadth = 40 - x$

$= \quad$ Area of rectangular park $= l \times b$

$= x(40 - x) = 400$

$= 40x - x^2 = 400$

$= x^2 - 40x + 400 = 0$

$= \quad x^2 - 20x - 20x + 400 = 0$

$= \quad (x-20)(x-20) = 0$

$x = 20$

∴ Length of park $= 20m$ and its broadth $=$
$\qquad\qquad\qquad\qquad\qquad\qquad 40 - 20 = 20m$.