Exercise 4.4

1)

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

Compairing the equation with $ax^2 + bx + c = 0$ we get,

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

We know Discriminant $= b^2 - 4ac$

$= (-3)^2 - 4(2)(5) = 9 - 40$

$= -31$

As you can see $b^2 - 4ac < 0$

Therefore no real root is possible for the given equation $2x^2 - 3x + 5 = 0$.

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

Compairing the equation with $ax^2 + bx + c = 0$ we get,

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

We know discriminant $b^2 - 4ac$

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

$48 - 48$

$= 0$

Real root exist.

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

Comparing the equation with $ax^2 + bx + c = 0$ we get

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

Also we know Discriminant $= b^2 - 4ac$

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

$= 12$

2)

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

Comparing the given equation with $ax^2 + bx + c = 0$ we get,

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

$k^2 - 24 = 0$

$k^2 = 24$

$k = \pm\sqrt{24} = \pm 2\sqrt{6}$

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

Comparing the given equation with $ax^2 + bx + c = 0$ we get

For equal roots

$b^2 - 4ac = 0$

$4k^2 - 24 = 0$

$4k(k - 6) = 0$

$k = 0$ or $k = 6$

3) Let the length of mango grove be l

length of Mango grove will be $2l$

Area of mango grove $= (2l)l$

$= 2l^2$

$2l^2 = 800$

$l^2 = 800/2$

$= 400$

As we know discriminant

$l = \pm 20$

As we know the value of length cannot be negative

Therefore breath of mango grove $= 20m$

Length of mango grove $= 2 \times 20$

$= 40m$

4) The age of one friend $= x$ yrs

Another friend age $= (20 - x)$ yrs

Four years ago

Age of first friend $= (x-4)$ yrs

Age of second friend $(20-x-4)$ yrs

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

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

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

Therefore there will be no real solution

5) Let the length and breadth of the park be l and b

Perimeter of rectangular park $= 2(l+b) = 80$

Area of rectangular park $= l \times b$

$l(40-l)$

$= 40l - l^2$

$= 400$

Since Discriminant

$(40)^2 - 4 \times 400$

$= 1600 - 1600 = 0$

Root of equation $l = -b/2a$ $l = 40/2 = 20$

$L = 20$ $B = 40 - 20 = 20$