

24/06/21
exo

Exercise 4.4.

1. i) $x^2 - 3x - 10 = 0$
 $= x^2 - 5x + 2x - 10 = 0$
 $= x(x-5) + 2(x-5) = 0$
 $= (x-5)(x+2) = 0$
 $= x-5 = 0, x+2 = 0.$
 $x = 5 \text{ or } x = -2.$

ii) $2x^2 + 4x - 3x - 6 = 0$
 $= 2x(x+2) - 3(x+2) = 0$
 $= (x+2)(2x-3) = 0$
 $= x+2 = 0, 2x-3 = 0.$
 $x = -2, x = \frac{3}{2}.$

iii) $\sqrt{2x^2 + 7x + 5\sqrt{2}} = 0$
 $= \sqrt{2x^2 + 5x + 2x + 5\sqrt{2}} = 0$
 $= x(\sqrt{2x} + 5) + \sqrt{2}(\sqrt{2x} + 5) = 0$
 $= (\sqrt{2x} + 5)(x + \sqrt{2}) = 0.$
 $= \sqrt{2x} + 5 = 0, x + \sqrt{2} = 0.$

2. i) $2x^2 + kx + 3 = 0$
 $a = 2, b = k, c = 3$
 $= k^2 - 4 \times 2 \times 3$
 $= k^2 - 24.$

$D = 0$

$k^2 - 24 = 0$

$k^2 = 24$

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

$= \pm 2\sqrt{6}.$

$$\text{ii) } kn(n-2) + 6 = 0$$

$$kn^2 - 2kn + 6 = 0.$$

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

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

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

$$= 0 = 0.$$

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

$$k(4k - 24) = 0$$

$$k = 0.$$

$$4k = 24$$

$$k = \frac{24}{4} = 6.$$

3. Breadth = n cm.

Length = $2n$ cm.

ATQ/

$$L \times b = \text{Area.}$$

$$n \times 2n = 800$$

$$2n^2 = 800$$

$$n^2 = 400 \quad (20)^2$$

$$n = 20.$$

$$b = 20 \text{ m}, L = 40 \text{ m}$$

4. Let the present age of one friend be n .

present age of the other friend $(20-n)$

4 yrs ago, one friend's age was $(n-4)$

4 yrs ago other's friend age $(20-n-4) = (16-n)$ yrs.

ATQ/

$$\begin{aligned} & (x-4)(16-x) = 48 \\ & = 16x - x^2 - 64 + 4x = 48 \\ & \Rightarrow x^2 - 20x + 112 = 0 \end{aligned}$$

$$\begin{aligned} \Rightarrow D &= b^2 - 4ac \\ &= (-20)^2 - 4 \times 1 \times 112 \\ &= 400 - 448 \\ &= -48 < 0 \quad \Rightarrow D < 0 \end{aligned}$$

\therefore Situation not possible.

Ex. length of rectangular park = $2(L+B)$

$$\begin{aligned} & \Rightarrow 2(x+B) = 80 \\ & \Rightarrow \text{Breadth} = 40 - x \end{aligned}$$

$$\Rightarrow \text{Area} = L \times B.$$

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

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

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

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

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

$$\Rightarrow x = 20$$

length = 20 m.

breadth = $40 - 20 = 20$ m.

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