Quadratic Equations Ex 8.13 Q4

Answer :

Let the total number of swans be x.

Then, total numbers of swans are playing on the share of a pond $= \dfrac{7}{2}\sqrt{x}$

It is given that

$$\dfrac{7}{2}\sqrt{x} + 2 = x$$

Let $x = y^2$, then $\dfrac{7}{2}y + 2 = y^2$

$$\dfrac{7y+4}{2} = y^2$$

$$2y^2 = 7y + 4$$

$$2y^2 - 7y - 4 = 0$$

$$2y^2 + 8y - y - 4 = 0$$

$$2y(y+4) - 1(y+4) = 0$$

$$(y+4)(2y-1) = 0$$

$(y+4) = 0$ or $(2y-1) = 0$

$y = -4$ $y = \dfrac{1}{2}$

Because $y = \dfrac{1}{2}$ is not correct.

Thus, $y = -4$ is correct. Putting the value of y

$$y = -4$$

$$\sqrt{x} = -4$$

Square root both sides, we get

$$\left(\sqrt{x}\right)^2 = (-4)^2$$

$$x = 16$$

Therefore, the total number of swans be $\boxed{x = 16}$

Quadratic Equations Ex 8.13 Q5

Answer :

Let the original list price of the toy be Rs. x .

Then, the number of toys brought for Rs.360 $= \dfrac{360}{x}$

According to question, reduced list price of the toys $= Rs.(x-2)$.

Therefore, the number of toys brought for Rs.360 $= \dfrac{360}{x-2}$

It is given that

$$\dfrac{360}{x-2} - \dfrac{360}{x} = 2$$

$$\dfrac{360x - 360(x-2)}{(x-2)x} = 2$$

$$\dfrac{\cancel{360x} \cancel{-360x} + 720}{(x-2)x} = 2$$

$$\dfrac{720}{(x-2)x} = 2$$

$$2(x^2 - 2x) = 720$$

$$(x^2 - 2x) = 360$$

$$x^2 - 2x - 360 = 0$$

$$x^2 + 18x - 20x - 360 = 0$$

$$x(x+18) - 20(x+18) = 0$$

$$(x+18)(x-20) = 0$$

$$(x+18) = 0 \quad \text{or} \quad (x-20) = 0$$

$$x = -18 \qquad\qquad x = 20$$

Because x cannot be negative.

Thus, $x = 20$ is the require solution.

Therefore, the original list price of the toy be $\boxed{x = Rs.\ 20}$

Quadratic Equations Ex 8.13 Q6

Answer:

Let the original number of persons be x.

Then, by the given information,

$$\frac{9000}{x} - 160 = \frac{9000}{x+20}$$

$$\frac{9000 - 160x}{x} = \frac{9000}{x+20}$$

$$(x+20)(9000 - 160x) = 9000x$$

$$9000x - 160x^2 + 180000 - 3200x = 9000x$$

$$160x^2 - 180000 + 3200x = 0$$

$$x^2 - 1125 + 20x = 0$$

$$x^2 - 1125 + 20x + 100 = 100$$

$$(x+10)^2 = 1225$$

$$x + 10 = 35$$

$$x = 25$$

Thus, the original number of persons is Rs 25.

********** END *********