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 $=\frac{7}{2}\sqrt{x}$

It is given that

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

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

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

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

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

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

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

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

$$(y+4)=0 \quad \text{or} \quad (2y-1)=0$$

$$y=-4 \quad \text{or} \quad y=\frac{1}{2}$$

Because $y=\frac{1}{2}$ 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 $= \frac{360}{x}$

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

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

It is given that

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

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

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

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

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

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

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

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

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

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

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

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

Because x cannot be negative.

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

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

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 **********