

INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

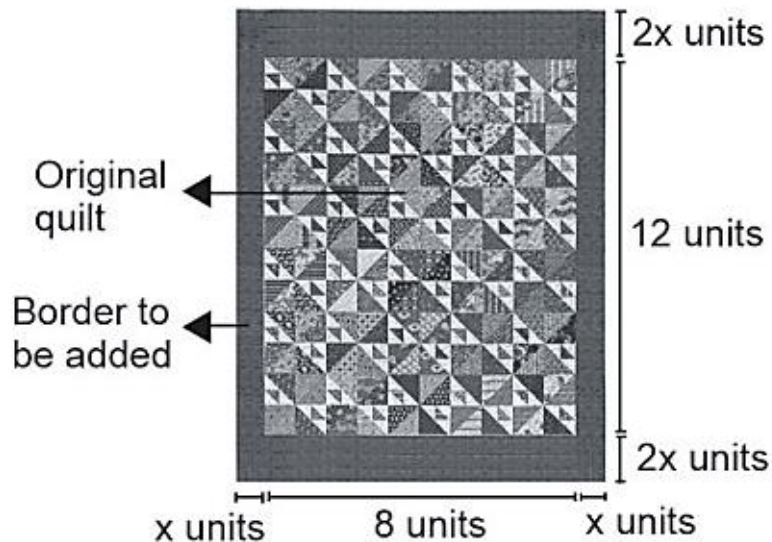
Class X

Worksheet - Quadratic Equations

17- 10 - 2023

Case Study – Based Questions

I A quilt maker has a rectangular quilt measuring 12 units by 8 units. He wants to add a border to it as shown in the figure below. He has 64 square units of fabric for the border.



1.	Find the area of the original quilt.	1m
2.	Find the area of the quilt with the border.	1m
3.	If x and $2x$ are the widths of the border as shown, frame a quadratic equation using the total area enclosed by the new quilt (with the border).	2m
4.	Find the measures of the new quilt (with the border).	2m

II Riya has a lawn with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. The length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole lawn is 1260 m^2 .



5.	If the length of the flowerbed is x m then what is the total length of the lawn?	1m
6.	What is the perimeter of the whole field?	1m
7.	What is the value of x if the area of the total lawn is 1260 m^2 ?	2m
8.	What is the ratio of area of flowerbed to area of grassland?	2m

III John and Priya went for a small picnic. After having their lunch Priya insisted to travel in a motor boat. The speed of the motor boat was 20 km/hr. Priya being a Mathematics student wanted to know the speed of the current. So, she noted the time for upstream and downstream. She found that for covering the distance of 15 km the boat took 1 hour more for upstream than downstream.



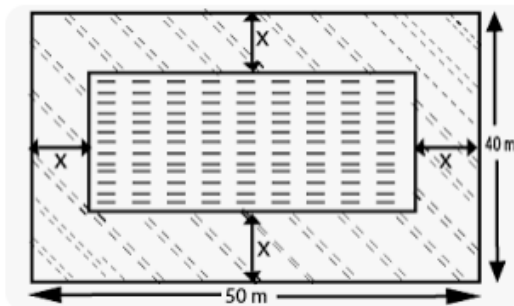
9.	If speed of the current be x km/hr. then what is the speed of the motorboat upstream?	1m
10.	Frame the quadratic equation for the given situation.	1m
11.	Find the speed of the current.	2m
12.	Find the time taken by the boat to travel downstream.	2m

IV Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.



13.	Write the expression for the distance covered by Ajay's car in two hours?	1m
14.	Find the quadratic equation that describes the situation.	1m
15.	What is the speed of Raj's car?	2m
16.	Find the time taken by Ajay to travel 400 km?	2m

V In the centre of a rectangular lawn of dimensions 50 m x 40 m, a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 sq. m.



17.	If the distance between the pond and lawn is x metre, write the expression for length and breadth of the pond.	1m
18.	Find the quadratic equation that describes the situation.	1m
19.	Find the length and breadth of the pond.	2m
20.	Find the perimeter of the rectangular lawn.	2m

ANSWERS

Q.1	96 sq. units	Q.2	160 sq. units	Q.3	$8x^2 + 56x - 64 = 0$	Q.4	16 units, 10 units
Q.5	$3x + 3$	Q.6	$8x + 6$	Q.7	20 m	Q.8	$\frac{20}{43}$
Q.9	$(20 - x)$ km/hr.	Q.10	$x^2 + 30x - 400 = 0$	Q.11	10 km/hour	Q.12	30 minutes
Q.13	$2(x+5)$ km	Q.14	$x^2 + 5x - 500 = 0$	Q.15	20 km/hour	Q.16	16 hours
Q.17	$50 - 2x, 40 - 2x$	Q.18	$x^2 - 45x + 296 = 0$	Q.19	34m, 24m	Q.20	180m