

INDIAN SCHOOL AL WADI AL KABIR

Class X, Mathematics

Worksheet-Quadratic Equations

Q. No.	Questions of 1 Mark each.							
1.	The real roots of the equation $x^{\frac{2}{3}} + x^{\frac{1}{3}} - 2 = 0$ are:							
	A	1, 8	B	-1, -8	C	1, -8	D	-1, 8
2.	The discriminant of the quadratic equation $(x + 5)^2 = 2(5x - 3)$ is:							
	A	5	B	124	C	-5	D	-124
3.	The product of Gopi's age, 5 years ago with his age 9 years later is 15, then Gopi's present age is:							
	A	6	B	8	C	10	D	12
4.	The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has							
	A	two distinct real roots	B	two equal real roots	C	no real roots	D	more than two real roots
5.	At t minutes past 2 p.m. the time needed by the minutes hand of a clock to show 3 p.m. was found to be 3 minutes less than $\frac{t^2}{4}$, then the value of t is:							
	A	14	B	104	C	19	D	30
6.	If the equation $x^2 - mx + 1 = 0$ does not possess real roots, then							
	A	$m > 2$	B	$m < -2$	C	$-2 < m < 2$	D	$-3 < m < 3$
7.	Which of the following has 2 as a root?							
	A	$x^2 - 4x + 5 = 0$	B	$x^2 - 3x - 12 = 0$	C	$2x^2 - 7x + 6 = 0$	D	$3x^2 - 6x - 2 = 0$
8.	A lad was asked his age by his friend. The lad said, "The number you get when you subtract 25 times my age from twice the square of my age will be thrice your age." If the friend's age is 14, then the age of the lad (in years) is:							
	A	21	B	28	C	14	D	25
9.	The positive root of $\sqrt{3x^2 + 6} = 9$ is:							
	A	3	B	1	C	81	D	5

10.	If the roots of the equation $m^2x^2 + 2x(mc - 2a) + c^2 = 0$ are equal, then c is:							
	A	$2am$	B	$\frac{a}{m}$	C	am^2	D	$\frac{m}{a}$
	DIRECTION: In the question number 11 and 12, a statement of assertion (A) is followed by statement of Reason (R). Choose the correct option (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.							
11.	Assertion: Values of x are $\frac{-a}{2}$, a for a quadratic equation $2x^2 + ax - a^2 = 0$. Reason: For quadratic equation $ax^2 + bx + c = 0$, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.							
12.	Assertion: The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are not real. Reason: If discriminant $b^2 - 4ac < 0$, then the roots of the equation $ax^2 + bx + c = 0$ are not real.							
	Questions of 2 marks each							
13.	Represent the situation in the form of Quadratic equation: “The product of Rohan’s age (in years) 5 years ago with his age 9 years later is 15.							
14.	Find the value of k for which the roots of the quadratic equation $2x^2 + kx + 8 = 0$ will have equal value.							
15.	Find the roots of quadratic equation by factorisation: $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$.							
16.	The sum of the squares of three positive numbers that are consecutive multiples of 5 is 725. Find the three numbers.							
17.	The caretaker of the park is attempting to plant saplings in the form of a square. That is, number of rows of saplings is the same as the number of columns of saplings. On arranging the saplings, he found that 24 saplings were still left with him. When he increased the number of rows and columns by 1, he found that he was short of 25 saplings. Find the number of saplings available with him. Show your work.							

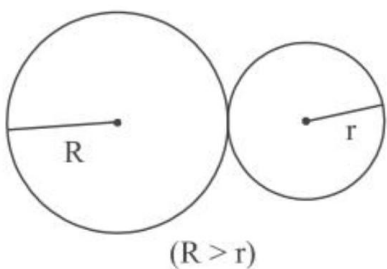
Questions of 3 marks each

18.	Ramesh wants to design a rectangular park of perimeter 80 meters and area 400 m^2 for jogging and walk for the people of colony. Is it possible to design the park? If so, find the length and breadth of the park.
19.	Solve for x: $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}$; $x \neq 0, 1, 2$
20.	The speed of boat in still water is 15 km/h. It can go 30 km upstream and return downstream to the original point in 4 hour and 30 minutes. Find the speed of stream.
21.	If α and β are roots of the quadratic equation $x^2 - 7x + 10 = 0$, find the quadratic equation whose roots are α^2 and β^2 .

Question of 5 marks

22.	In a flight of 600 km, an aircraft was slowed due to bad weather. Its average speed for the trip was reduced to 200 km/hr and time of flight increased by 30 minutes. Find the original duration of flight.
23.	The age of a man is twice the square of the age of his son. Eight years hence, the age of the man will be 4 years more than three times the age of his son. Find their present ages.
24.	Find the value of 'k' for which the quadratic equation $(k + 1)x^2 - 6(k + 1)x + 3(k + 9) = 0$, $k \neq -1$ has real and equal roots.

Question of 4 marks

25.	Case Study Based: To keep the lawn green and cool, Sadhna uses water sprinklers which rotate in circular shape and cover a particular area. The diagram below shows the circular areas covered by two sprinklers :   Two circles touch externally. The sum of their areas is $130 \pi \text{ sq m}$ and the distance between their centres is 14 m.
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	Based on above information, answer the following questions : (i) Obtain a quadratic equation involving R and r from above. (ii) Write a quadratic equation involving only r. (iii) (a) Find the radius r and the corresponding area irrigated. OR (b) Find the radius R and the corresponding area irrigated.							
	Answers							
Answers	1	C	2	D	3	A	4	C
	5	A	6	C	7	C	8	C
	9	D	10	B	11	d	12	a
	13	$x^2 + 4x - 60 = 0$	14	± 8	15	$-\sqrt{2}, \frac{-5}{\sqrt{2}}$	16	10, 15, 20
	17	600	18	20m, 20 m	19	$\frac{4}{3}, 3$	20	5 km/hr
	21	$x^2 - 29x + 100 = 0$	22	1hr	23	4yrs, 32 yrs	24	3
	25	(i) $R^2 + r^2 = 130$ (ii) $r^2 - 14r + 33 = 0$ (iii) (a) $9\pi \text{ m}^2$ OR (b) $12\pi \text{ m}^2$						