QUADRATIC EQUATIONS

MCQs & A and R WORK SHEET

Test / Exam Name: Quadratic Equations	**Standard: 10th**	**Subject: Mathematics**
Student Name: _____	**Section:** _____	**Roll No.:** _____

Questions: 45	Time: 01:30 hh:mm	Negative Marks: 0	Marks: 45

Instructions

1. MULTIPLE CHOICE QUESTIONS.

Q1. If $ax^2 + bx + c = 0$ has equal roots, then c is equal to: **1 Mark**

A $-\frac{b^2}{2a}$ **B** $-\frac{b^2}{4a}$ **C** $\frac{b^2}{4a}$ **D** $\frac{b^2}{4a}$

Q2. The roots of the quadratic equation $x^2 - 0.04 = 0$ are: **1 Mark**

A ± 0.2 **B** ± 00.2 **C** 0.4 **D** 2

Q3. Choose the correct answer from the given four options in the following questions: **1 Mark**
Which of the following equations has the sum of its roots as 3?

A $2x^2 - 3x + 6 = 0.$ **B** $-x^2 + 3x - 3 = 0.$ **C** $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0.$ **D** $3x^2 - 3x + 3 = 0$

Q4. The discriminant of the equation $(2a + b) x = x^2 + 2ab$ is ...... **1 Mark**

A $(2a + b^2)$ **B** $(2a - b)^2$ **C** $(2a + b)^2$ **D** $(2a - b^2)$

Q5. $x^2 - 6ax = -6a^2$ discriminant of the given equation is ..... **1 Mark**

A $4a^2$ **B** $12a^2$ **C** $2a^2$ **D** $6a^2$

Q6. If the equation $x^2 - ax + 1 = 0$ has two distinct roots, then: **1 Mark**

A $|a| = 2$ **B** $|a| < 2$ **C** $|a| > 2$ **D** None of these.

Q7. $(x - 1) (2x - 1) = 0$ discriminant of the given equation is: **1 Mark**

A 0 **B** 2 **C** 1 **D** 3

Q8. If $x = 2$ is a root of the quadratic equation $3x^2 - px - 2 = 0$, then the value of p is: **1 Mark**

A 1 **B** 5 **C** 3 **D** 0

Q9. Which of the following is a quadratic equation? **1 Mark**

A $(x^2 + 1) = (2 - x)^2 + 3$ **B** $x^3 - x^2 = (x - 1)^3$ **C** $2x^2 + 3 = (5 + x)(2x - 3)$ **D** None of these.

Q10. The quadratic equation whose roots are $7 + \sqrt{3}$ and $7 - \sqrt{3}$ is: **1 Mark**

A $x^2 - 14x + 46 = 0$ **B** $x^2 - 14x - 46 = 0$ **C** $x^2 + 14x + 46 = 0$ **D** $x^2 + 14x - 46 = 0$

Q11. The roots of the equation $x^2 + x - p(p + 1) = 0$, where p is a constant, are: **1 Mark**

A p, p + 1 **B** -p, p + 1 **C** p, - (p + 1) **D** $-p, - (p + 1)$

Q12. The roots of the quadratic equation $2x^2 - x - 6 = 0$ are: **1 Mark**

A $-2, \frac{3}{2}$ **B** $2, \frac{-3}{2}$ **C** $-2, \frac{-3}{2}$ **D** $2, \frac{3}{2}$

Q13. A quadratic equation whose one root is 3 is: **1 Mark**

A $x^2 - 5x - 6 = 0$ **B** $x^2 - 6x - 6 = 0$ **C** $x^2 - 5x + 6 = 0$ **D** $x^2 + 6x - 5 = 0$

Q14. $4x^2 - 20x + 25 = 0$ have: **1 Mark**

A Real roots **B** No Real roots **C** Real and Equal roots **D** Real and Distinct roots

Q15. The roots of the equation $x^2 - 3x - m(m + 3) = 0$, where m is a constant, are: **1 Mark**

A m, m + 3 **B** -m, m + 3 **C** m, -(m + 3) **D** -m, -(m: 3)

Q16. Let $b = a + c$. Then the equation $ax^2 + bx + c = 0$ has equal roots if: **1 Mark**

A a = -c **B** a = 2c **C** a = c **D** a = -2c

Q17. A quadratic equation $ax^2 + bx + c = 0$ has real and distinct roots, if: **1 Mark**

A None of these **B** $b^2 - 4ac < 0$ **C** $b^2 - 4ac = 0$ **D** $b^2 - 4ac > 0$

Q18. $\sqrt{2}x^2 - 3x - 5 = 0$ have: **1 Mark**

A Real and Equal roots **B** Real roots **C** Real and Distinct roots **D** No Real roots

Q19. If one root the equation $2x^2 + kx + 4 = 0$ is 2, then the other root is: **1 Mark**

A 6 **B** -6 **C** -1 **D** 1

Q20. If the equation $x^2 - kx + 1 = 0$ has no real roots, then: **1 Mark**

A k < -2 **B** k > 2 **C** -2 < k < 2 **D** None of these.

Q21. If $(a^2 + b^2)x^2 + 2(ab + bd)x + c^2 + d^2 = 0$ has no real roots, then: **1 Mark**

| **A** $ab = bc$ | **B** $ab = cd$ | **C** $ac = bd$ | **D** $ad \neq bc$ |

Q22. The two numbers whose sum is 27 and their product is 182 are: **1 Mark**

| **A** 14 and 15 | **B** 12 and 13 | **C** 13 and 14 | **D** 12 and 15 |

Q23. The values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is: **1 Mark**

| **A** 8 only | **B** 0 only | **C** 4 | **D** 0, 8 |

Q24. If $\sin \alpha$ and $\cos \alpha$ are the roots of the equations $ax^2 + bx + c = 0$, then $b^2 =$ **1 Mark**

| **A** $a^2 - 2ac$ | **B** $a^2 + 2ac$ | **C** $a^2 - ac$ | **D** $a2 + ac$ |

Q25. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6+}}}\ldots$ is: **1 Mark**

| **A** 4 | **B** 3 | **C** -2 | **D** 3.5 |

Q26. If the sum of the roots of the equation $x^2 - x = \lambda(2x - 1)$ is zero, then $\lambda =$ **1 Mark**

| **A** -2 | **B** 2 | **C** $-\frac{1}{2}$ | **D** $\frac{1}{2}$ |

Q27. If one root of the equation $4x^2 - 2x + (\lambda - 4) = 0$ be the reciprocal of the other, then $\lambda =$ **1 Mark**

| **A** 8 | **B** -8 | **C** 4 | **D** -4 |

Q28. If the sum of a number and its reciprocal is $2\frac{1}{2}$ then the number are: **1 Mark**

| **A** None of these | **B** 2 and $\frac{1}{2}$ | **C** 1 and $\frac{3}{2}$ | **D** 3 and $\frac{1}{3}$ |

Q29. The perimeter of a rectangle is 82m and its area is $400m^2$. The breadth of the rectangle is: **1 Mark**

| **A** 25m | **B** 20m | **C** 16m | **D** 9m |

Q30. In a cricket match, Kumble took three wickets less than twice the number of wickets taken by Srinath. The product of the number of wickets taken by these two is 20, then the number of wickets taken by Kumble is: **1 Mark**

| **A** 2 | **B** 4 | **C** 10 | **D** 5 |

Q31. Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360, then Rohan's present age is: **1 Mark**

| **A** 10 years | **B** 6 years | **C** 7 years | **D** 8 years |

Q32. The hypotenuse of a right triangle is 6m more than twice the shortest side. The third side is 2m less than the hypotenuse. The representation of the above situation in the form of a quadratic equation is: **1 Mark**

| **A** $(2x + 6)_2 = x^2 - (2x + 4)^2$ | **B** None of these | **C** $(2x + 6)^2 + x^2 = (2x + 4)^2$ | **D** $(2x + 6)^2 = x^2 + (2x + 4)^2$ |

Q33. A train travels 360km at a uniform speed. If the speed had been 5km/ hr more, it would have taken 1 hour less for the same journey, then the actual speed of the train is: **1 Mark**

| **A** 48km/ hr | **B** 40km/ hr | **C** 36km/ hr | **D** 45km/ hr |

Q34. 500 bananas were divided equally among a certain number of students. If there were 25 more students, each would have received one banana less. Then the number of students is: **1 Mark**

| **A** 125 | **B** 100 | **C** 250 | **D** 500 |

Q35. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion: $(2x - 1)^2 - 4x^2 + 5 = 0$ is not a quadratic equation.

Reason: An equation of the form $ax^2 + bx + c = 0$, $a \neq 0$, where a, b, c ∈ R is called a quadratic equation.

A If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C If Assertion is correct but Reason is incorrect.   **D** If Assertion is incorrect but Reason is correct.

Q36. **Assertion:** $3y^2 + 17y - 30 = 0$ have distinct roots. **1 Mark**

Reason: The quadratic equation $ax2 + bx + c = 0$ have distinct roots (real roots) if D > 0.

A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

C Assertion is correct statement but Reason is wrong statement.

D Assertion is wrong statement but Reason is correct statement.

Q37. **Assertion :** $4x^2 - 12x + 9 =$ has repeated roots. **1 Mark**

Reason : The quadratic equation $ax^2 + bx + c = 0$ have repeated roots if discriminant D>0

A If both assertion and reason are true and reason is the correct explanation of assertion.

B If both assertion and reason are true but reason is not the correct explanation of assertion.

C If assertion is true but reason is false.   **D** If both assertion and reason are false.

Q38.Assertion : Sum and product of roots of $2x^2 - 3x + 5 = 0$ are $\frac{3}{2}$ and $\frac{5}{2}$ respectively.   **1 Mark**

    Reason : If a and b are the roots of $ax2 + bx + c = 0$, $a \neq q0$, then sum of roots $= \alpha + \beta = -\frac{b}{a}$ and product of roots $= \alpha\beta = \frac{c}{a}$.

A If both assertion and reason are true and reason is the correct explanation of assertion.

B If both assertion and reason are true but reason is not the correct explanation of assertion.

C If assertion is true but reason is false.   **D** If both assertion and reason are false.

Q39.Assertion : The value of kk for which the equation $kx^2 - 12x + 4 = 0$ has equal roots, is 9.   **1 Mark**

    Reason : The equation $ax^2 + bx + c = 0, (a \neq q0)$ has equal roots, if b2 - 4ac > 0.

A If both assertion and reason are true and reason is the correct explanation of assertion.

B If both assertion and reason are true but reason is not the correct explanation of assertion.

C If assertion is true but reason is false.   **D** If both assertion and reason are false.

Q40.Assertion: The value of k for which the equation $kx^2 - 12x + 4 = 0$ has equal roots, is 9.   **1 Mark**

    Reason: The equation $ax2 + bx + c = 0$, $(0 \neq a)$ has equal roots, if $(b^2 - 4ac) > 0$.

A Assertion and Reason both are correct statements and Reason is the correct explanation of Assertion.

B Assertion and Reason both are correct statements but Reason is not the correct explanation of Assertion.

C Assertion is correct statement but Reason is wrong statement.

D Assertion is wrong statement but Reason is correct statement.

Q41.Assertion: The equation $9x^2 + 3kx + 4 = 0$ has equal roots for k = ±4.   **1 Mark**

    Reason: If discriminant 'D' of a quadratic equation is equal to zero then the roots of equation are real and equal.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but 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

Q42.Assertion : The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary.   **1 Mark**

    Reason : If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are imaginary.

A Both assertion (A) and reason (R) are true and reason (R) isthe correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but 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

Q43.Assertion : $2x^2 - 4x + 3 = 0$ is a quadratic equation.   **1 Mark**

    Reason : All polynomials of degree n, when n is a whole number can be treated as quadratic equation.

A If both assertion and reason are true and reason is the correct explanation of assertion.

B If both assertion and reason are true but reason is not the correct explanation of assertion.

C If assertion is true but reason is false.   **D** If both assertion and reason are false.

Q44. The two roots of the quadratic equation $2x^2 + 7x - 15 = 0$ **1 Mark**

A are both positive   **B** are both negative   **C** are of opposite signs.   **D** none of these.

Q45. The zeroes of the quadratic equation $4x^2 - 7x + 3 = 0$ **1 Mark**

A are both negative   **B** are both positive   **C** are of opposite signs   **D** none of these