# Maths 10th (Quadratic Equations) Paper I

**Total Time:** 1 Hour **Total Marks:** 30

**General Instructions:**
1. All questions are **compulsory**.
2. There is no choice in any of the questions.
3. Question numbers **1** to **3** in Section A are one-mark questions.
4. Question numbers **4** to **7** in Section A are two-mark questions.
5. Question numbers **8** to **10** in Section A are three-mark questions.
6. Question numbers **11** to **12** in Section A are five-mark questions.

**Question 1.** If in a quadratic equation, the coefficient of $x$ is zero, then the quadratic equation has no real roots. Is the following statement 'True' or 'False'? Justify your answer.

**Question 2.** If the coefficient of $x^2$ and the constant term of a quadratic equation have opposite signs, then the quadratic equation has real roots. Is the following statement 'True' or 'False'? Justify your answer.

**Question 3.** If $b = 0$, $c < 0$, is it true that the roots of $x^2 + b\,x + c = 0$ are numerically equal and opposite in sign? Justify.

**Question 4.** Does there exist a quadratic equation whose coefficients are all distinct irrationals but both the roots are rational? Why?

**Question 5.** Solve for $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots \text{ to } \infty}}}}$

**Question 6.** Find the roots of the quadratic equation $2x^2 + (5/3)\,x - 2 = 0$ by the factorisation method.

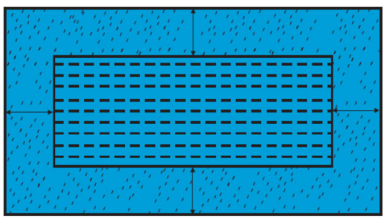
**Question 7.** $x = \dfrac{1}{2-\dfrac{1}{2-\dfrac{1}{2-x}}}$. Find $x$.

**Question 8.** If $-4$ is a root of the quadratic equation $x^2 + p\,x - 4 = 0$ and quadratic equation $x^2 + p\,x + k = 0$ has equal roots, find the value of k.

**Question 9.** Solve: $16\,x^2 - 8a^2\,x + (a^4 - b^4) = 0$ for $x$ by completing square method.

**Question 10.** A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?

**Question 11.** In the centre of a rectangular lawn of dimensions 50 m × 40 m, a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 $m^2$. Find the length and breadth of the pond.



**Question 12.** At $t$ minutes past 2 pm, the time needed by the minute's hand of a clock to show 3 pm was found to be 3 minutes less than $t^2/4$ minutes. Find $t$.