


# QUADRATIC EQUATIONS

*Physics is mathematical not because we know so much about the physical world, but because we know so little; it is only its mathematical properties that we can discover.*

By **O.P. GUPTA** Math Mentor  
INDIRA AWARD WINNER

 For detailed solutions, check YouTube Channel.



[YouTube.com/MathematiciaByOPGupta](https://www.youtube.com/MathematiciaByOPGupta)

☆ Multiple Choice Questions, with **only** one correct option.

- Q01. The general form of a quadratic equation is:  
(a)  $ax^2 + bx + c$       (b)  $ax^2 + bx + c = 0$       (c)  $a^2x + b$       (d)  $ax^2 + bx + c = 0, a \neq 0$
- Q02. The number of possible solutions of a quadratic equation are:  
(a) exactly two      (b) at most two      (c) at least two      (d) None of these
- Q03. The discriminant of the equation  $bx^2 + ax + c = 0, b \neq 0$  is given by:  
(a)  $\sqrt{b^2 - 4ac}$       (b)  $\sqrt{a^2 + 4bc}$       (c)  $\sqrt{a^2 - 4bc}$       (d)  $\sqrt{b^2 + 4ac}$
- Q04. If the roots of a quadratic equation are equal, then the discriminant is:  
(a) 1      (b) 0      (c) greater than 0      (d) less than 0
- Q05. The roots of  $3x^2 - 7x + 4 = 0$  are:  
(a) rationals      (b) irrationals      (c) positive integers      (d) negative integers
- Q06. The roots of equation  $x + \frac{16}{x} = 10$  are:  
(a) 4, 6      (b) 4, 4      (c) 4, 5      (d) 2, 8
- Q07. If  $\alpha, \beta$  are the roots of  $x^2 + px + q = 0$ , then the value of  $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$  is:  
(a)  $\frac{p^2 - 2q}{q}$       (b)  $\frac{2q - p^2}{q}$       (c)  $\frac{p^2 + 2q}{q}$       (d) None of these
- Q08. If the roots of  $ax^2 + bx + c = 0$  be equal, then the value of c is:  
(a)  $-\frac{b}{2a}$       (b)  $\frac{b}{2a}$       (c)  $-\frac{b^2}{4a}$       (d)  $\frac{b^2}{4a}$
- Q09. If the sum of the roots of an equation is 6 and one root is  $3 - \sqrt{5}$ , then the equation is:  
(a)  $x^2 - 6x + 4 = 0$       (b)  $x^2 - 4x + 6 = 0$       (c)  $x^2 - 6x + 5 = 0$       (d) None of these

- Q10. If  $\alpha, \beta$  be the roots of  $ax^2 + bx + c = 0$ , then the value of  $\alpha^2 + \beta^2$  is:
- (a)  $\frac{b^2 - 2ac}{2a}$       (b)  $\frac{b^2 - 4ac}{2a}$       (c)  $\frac{b^2 - 2ac}{a^2}$       (d)  $\frac{b^2 + 4ac}{2ac}$
- Q11. The quadratic equation whose roots are  $a, \frac{1}{a}$  is:
- (a)  $ax^2 - (a^2 + 1)x + a = 0$       (b)  $ax^2 - (a^2 - 1)x + a = 0$   
 (c)  $ax^2 - (a^2 - 1)x - a = 0$       (d) None of these
- Q12. The sum of the age of a son and his father is 35 years and the product is 150. Their ages are:
- (a) 15 years, 20 years      (b) 15 years, 10 years  
 (c) 5 years, 30 years      (d) 6 years, 30 years
- Q13. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. The speed of the train is:
- (a) 30 km/h      (b) 35 km/h      (c) 12 km/h      (d) 40 km/h
- Q14. The value of  $x$  on solving  $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$  will be:
- (a) -2, 1      (b) -2, -1      (c) 2, -1      (d) None of these
- Q15. What is the sum of the roots of the equation  $x(3x + 8) = 3$ ?
- (a)  $\frac{8}{3}$       (b)  $-\frac{8}{3}$       (c) 8      (d) 3
- Q16. The roots of the equation  $\sqrt{2x+9} + x = 13$  are:
- (a) 8, -20      (b) 20, -8      (c) -20, -8      (d) 20, 8
- Q17. The values of  $x$  on solving  $15x + \frac{3}{x} = 18$  are:
- (a) 5, 1      (b)  $\frac{2}{5}, \frac{1}{2}$       (c) 2, 3      (d)  $1, \frac{1}{5}$
- Q18. If  $\sqrt{x-7} + \sqrt{x-3} = 2$  then the value of  $x$  is:
- (a) 9      (b) 7      (c) 19      (d) 3
- Q19. If  $\frac{x}{2} + \frac{6}{x} = 4$ , then the value of  $x$  are:
- (a) -6 and -2      (b) +6 and -2      (c) -6 and 2      (d) 6 and 2
- Q20. If the sum of squares of two consecutive even numbers is 100, then the numbers are:
- (a) 4 and 6      (b) 8 and 10      (c) 10 and 12      (d) None of these
- Q21. The nature of the roots of quadratic equation  $x^2 - 8x + 12 = 0$  is:
- (a) real and equal      (b) real and unequal      (c) doesn't exist      (d) can't say
- Q22. If  $\alpha$  and  $\beta$  are the roots of  $ax^2 + bx + c = 0$ , then value of  $\alpha^2 + \beta^2 + 2\alpha\beta$  is:

- (a)  $\frac{a^2}{b^2}$                       (b)  $\frac{b^2}{a^2}$                       (c)  $-\frac{b^2}{a^2}$                       (d) Data insufficient

- Q23. Sum of the areas of two squares is  $468 \text{ m}^2$ . If the difference of their perimeter is 24 m, then the sides of the two squares are:  
 (a) 18 m, 14 m              (b) 13 m, 12 m              (c) 18 m, 12 m              (d) None of these
- Q24. If  $\frac{x}{16} - \frac{4}{x} = 0$ , then x is:  
 (a)  $\pm 3$                       (b)  $\pm 8$                       (c)  $\pm 16$                       (d)  $\pm 4$
- Q25. If  $x^2 + y^2 = 17$  and  $xy = 4$  then the value of  $\frac{x}{y} + \frac{y}{x}$  is:  
 (a)  $\frac{4}{17}$                       (b)  $\frac{17}{4}$                       (c)  $\frac{5}{4}$                       (d) None of these
- Q26. Sum of a number and its reciprocal is  $\frac{17}{4}$ , the number is:  
 (a) 4                      (b)  $\frac{1}{4}$                       (c) 5                      (d) options (a) and (b) both
- Q27. Sum of the squares of two consecutive natural numbers is 221 then, the numbers are:  
 (a) 9, 10                      (b) 10, 11                      (c) 11, 12                      (d) 12, 13
- Q28. If  $\alpha$  and  $\beta$  are the roots of equation  $2x^2 - 5x + 3 = 0$  then  $\alpha^2\beta + \beta^2\alpha = \dots\dots?$   
 (a)  $\frac{5}{2}$                       (b)  $\frac{15}{4}$                       (c)  $\frac{3}{2}$                       (d)  $-\frac{15}{4}$
- Q29. Product of the age of a child five years ago with his age nine years after is 15. His present age is:  
 (a) 4 years                      (b) 6 years                      (c) 5 years                      (d) None of these
- Q30. If usual speed of a passenger train is increased by 5 km/h then, it takes 2 hour less in covering the distance of 300 km. Its usual speed is:  
 (a) 25 km/h                      (b) 20 km/h                      (c) 30 km/h                      (d) None of these
- Q31. Which of the following is not a quadratic equation:  
 (a)  $3x - \frac{5}{x} = x^2$                       (b)  $3 - x^2 - 8x = 0$                       (c)  $x + \frac{1}{x} = 8$                       (d)  $x^2 - 3 = 4x^2 - 4x$
- Q32. The equation which is not a quadratic equation in the followings is:  
 (a)  $x - \frac{3}{x} = 3$                       (b)  $x + \frac{1}{x} = 3$                       (c)  $3x + \frac{3}{x} = x^2$                       (d)  $3x^2 - 1 = 4x^2 - 4x$
- Q33. The value of k for which the equation  $2x^2 + 8kx + 8 = 0$  has equal roots is:  
 (a) Only 3                      (b) Only -3                      (c)  $\pm 3$                       (d)  $\pm 1$
- Q34. The value of k for which  $x = -2$  is a root of the equation  $kx^2 + x - 6 = 0$ :  
 (a)  $-\frac{3}{2}$                       (b) -1                      (c) -2                      (d) 2

- Q35. The value of 'p' so that the quadratic equation  $x^2 + 5px + 16 = 0$  has no real roots:
- (a)  $p > 8$                       (b)  $p < 5$                       (c)  $-\frac{8}{5} < p < \frac{8}{5}$                       (d)  $-\frac{8}{5} \leq p < 0$
- Q36. If  $px^2 + 3x + q = 0$  has two roots  $x = -1$  and  $x = -2$ , the value of  $q - p$  is:
- (a) -1                      (b) 1                      (c) 2                      (d) -2
- Q37. The common root of the equations  $x^2 - 3x + 2 = 0$  and  $2x^2 - 5x + 2 = 0$  is:
- (a)  $x = 2$                       (b)  $x = 1$                       (c)  $x = -2$                       (d)  $x = \frac{1}{2}$
- Q38. If  $x^2 - 5x + 1 = 0$ , the value of  $\left(x + \frac{1}{x}\right)$  is:
- (a) -2                      (b) -5                      (c) 5                      (d) 3
- Q39. If  $a - 3 = \frac{10}{a}$ , the values of 'a' are:
- (a) 5, 0                      (b) 5, 2                      (c) -5, 2                      (d) 5, -2
- Q40. If roots of the equation  $kx^2 + (a + b)x + ab = 0$  are '-1' and '-b' then, the value of 'k' is:
- (a) -1                      (b) 1                      (c) 2                      (d) -2
- Q41. The quadratic equation with real coefficients whose one root is  $2 + \sqrt{3}$  is:
- (a)  $x^2 - 2x + 1 = 0$                       (b)  $x^2 - 4x + 1 = 0$                       (c)  $x^2 - 4x + 3 = 0$                       (d)  $x^2 - 4x + 4 = 0$
- Q42. The difference of roots of the quadratic equation  $x^2 + kx + 12 = 0$  is 1, the positive value of k is:
- (a) -7                      (b) 7                      (c) 4                      (d) 8
- Q43. If 2, 3 are the roots of  $x^2 + px + q = 0$ , then the values of p and q are:
- (a) -5, 6                      (b) 6, 5                      (c) -6, 5                      (d) -5, -6
- Q44. The nature of the roots of  $x^2 - 4x + 1 = 0$  is:
- (a) real roots                      (b) no real roots  
(c) real and equal roots                      (d) None of these
- Q45. If  $x = \sqrt{7\sqrt{7\sqrt{7\sqrt{7\dots}}}}$  and  $y = \sqrt{20 + \sqrt{20 + \sqrt{20 + \dots}}}$  where  $x, y > 0$  then, which of the following isn't correct?
- (a)  $x + y = 12$                       (b)  $x - y = 3$                       (c)  $x^2 + y^2 = 74$                       (d)  $x^2 - y^2 = 24$
- Q46. If  $x = a, b$  are the two roots of  $9^x - 4 \times 3^{x+1} + 27 = 0$  then, which of the following isn't correct?
- (a)  $a + b = 3$                       (b)  $(a - b)^2 = 1$                       (c)  $\frac{a}{b} + \frac{b}{a} = \frac{5}{2}$                       (d)  $a + b = 4$
- Q47. If  $(\sqrt{2} + 1)^x + (\sqrt{2} - 1)^x - 2\sqrt{2} = 0$  then, sum of all possible values of x is:
- (a) 0                      (b) 1                      (c) 2                      (d) 3

## ANSWERS KEY

Q01. d	Q02. a	Q03. c	Q04. b	Q05. a	Q06. d	Q07. a
Q08. d	Q09. a	Q10. c	Q11. a	Q12. c	Q13. d	Q14. c
Q15. b	Q16. d	Q17. d	Q18. b	Q19. d	Q20. d	Q21. b
Q22. b	Q23. c	Q24. b	Q25. b	Q26. a	Q27. b	Q28. b
Q29. a	Q30. d	Q31. a	Q32. d	Q33. d	Q34. d	Q35. c
Q36. a	Q37. a	Q38. d	Q39. d	Q40. a	Q41. b	Q42. b
Q43. a	Q44. a	Q45. b	Q46. d	Q47. a		

# Dear math scholars,

We have taken utmost care while preparing this draft. Still chances of human error can't be ruled out. Please inform us about any Typing error / mistake in this document. This will help many future learners of Mathematics.

Email ID - [iMathematicia@gmail.com](mailto:iMathematicia@gmail.com)

WhatsApp @ +91 9650350480 (only message)

**O.P. GUPTA, Math Mentor**

[Maths (Hons.), E & C Engg., Indira Award Winner]

Follow us on Twitter @theopgupta

Follow us on Instagram @theopgupta

Official Website : [www.theOPGupta.com](http://www.theOPGupta.com)



[YouTube.com/MathematiciaByOPGupta](https://www.youtube.com/MathematiciaByOPGupta)

Buy our Books, Test Papers and Sample Papers at [theopgupta.com](http://theopgupta.com)

# MATHEMATICIA BY O.P. GUPTA

...a name you can bank upon!



To get FREE PDF Materials, join  
WhatsApp Teachers Group  
by Clicking on the Logo

If you are a Student, then you may join our Students Group

CLICK HERE FOR  
**CLASSES  
IX & X**

CLICK HERE FOR  
**CLASSES  
XI & XII**

You can add our WhatsApp no. +919650350480 to your Groups also

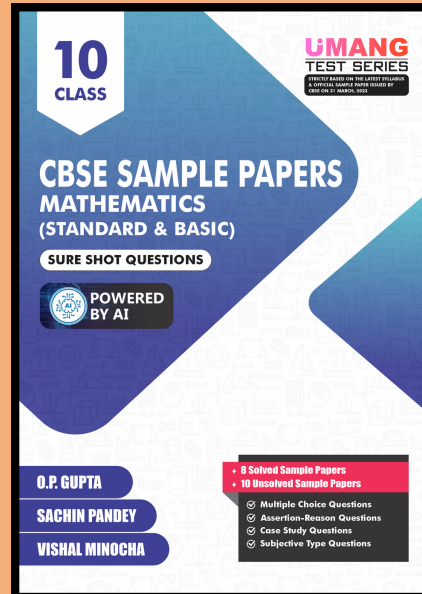
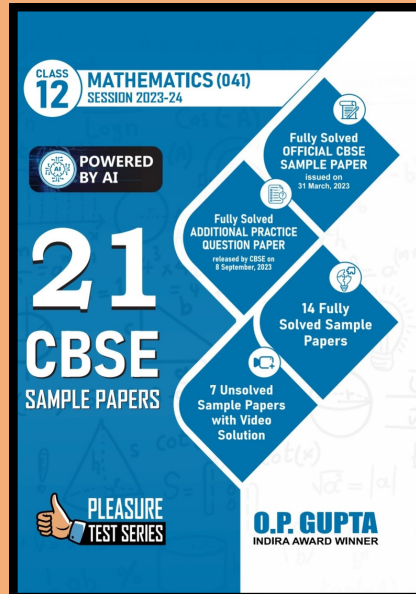
Feel Safe to Share this Document with other math scholars

**CLICK NOW**

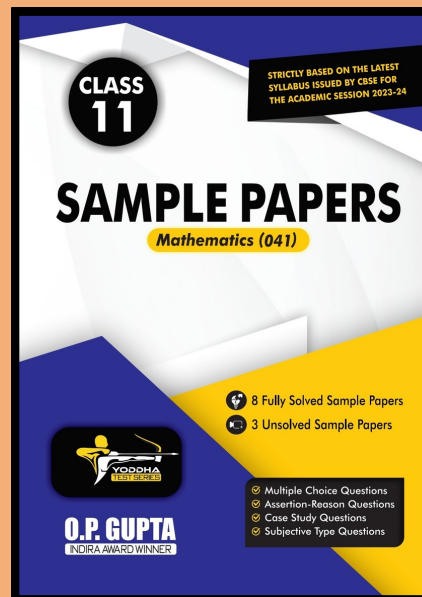
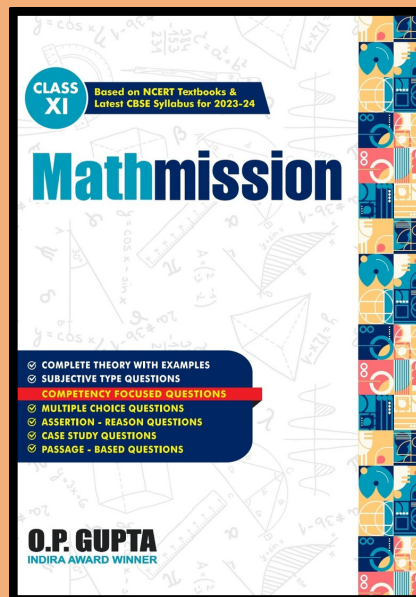
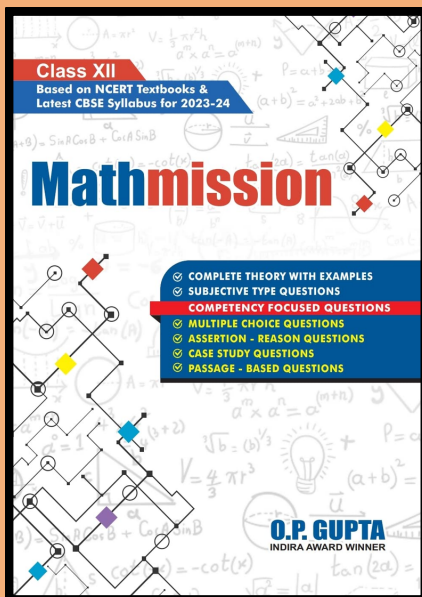
Download



**FREE PDF SAMPLE  
PAPERS FOR THE  
CLASSES XII, XI & X  
or, just type -  
bit.ly/m/theopgupta**



Click on the  
Image of any  
Book, to Buy it



Many Direct  
Questions  
from our  
Books have  
been asked  
in the recent  
CBSE Exams

Buy our  
books on  
**amazon**  
**Flipkart**