Quadratic Equations

Quick Study Guide

HOW TO USE THIS GUIDE

Highlighted text shows important points

- ★ MARKS HIGH-FOCUS TOPICS
- 📝 INDICATES EXAM TIPS
- ⚠ SHOWS COMMON ERRORS
- 💡 GIVES QUICK TIPS

STANDARD FORM

Mnemonic: "FAMILY ABC"

FAMILY
- Form standard
- 'a' coefficient of x^2
- Must not be zero
- Important terms
- Like terms group
- Yes all terms

ABC
- ax^2 term first
- bx = a = Baap (x^2)
- b = Beta (x)
- c = chota (constant)
- Always same order term next
- Constant last

Remember As:

DUKAAN SYSTEM
* Like shop calculations:
* Pen = x rupees
* Copy = y rupees
* Bill = Total amount
* Two items, two equations
*

Common Errors
* 'a' value zero
* Terms not grouped
* Powers missing
* Wrong signs

SOLVING METHODS

Mnemonic: "SOLUTION BOSS"

SOLUTION BOSS
- Square complete
- Or factorize
- Like terms group
- Use formula
- Try factors
- Important steps
- Or quadratic
- Nature check
- Best method pick
- Organize steps
- Solve carefully
- Solution verify

CHOOSE METHOD:

TARIKA HERO

1. Factorization when:
   * Easy factors visible
   * Perfect squares
2. Formula when:
   * Complex numbers
   * Not factorizable
3. Complete square:
   * Perfect square form
   * Practice questions

FACTORIZATION METHOD

Mnemonic: "FACTOR KARO"

FACTOR
- Find ac value
- Add to get b
- Check factors
- Try pairs
- Organize terms
- Right factors

KARO
- Keep signs correct
- Arrange terms
- Remember pairs
- Order maintain

QUICK STEPS:

SPLIT GAME

For $x^2 + 5x + 6$:
1. ac = 1 × 6 = 6
2. That adds to b = 5
3. Factors: 2 and 3
4. (x + 2)(x + 3)

Example:
* $x^2 + 7x + 12$
* ac = 12, b = 7
* Factors: 3,4
* (x + 3)(x + 4)

FORMULA METHOD

Mnemonic: "FORMULA KING"

FORMULA
- Formula yaad karo
- Organize values
- Remember signs
- Minus or plus
- Under root
- Look carefully
- All values put

KING
- Keep format
- Insert values
- Note signs
- Get both roots

Remember Points:

CHOCOLATE BAR
* $x = [-b \pm \sqrt{(b^2 - 4ac)}]/2a$

* "CHOCOLATE BAR"
* Like sharing chocolate:
* First half [-b/2a]
* Then pieces [$\pm \sqrt{(b^2 - 4ac)}/2a$]

: NATURE OF ROOTS

Mnemonic: "ROOTS TYPE"

ROOTS
- Real distinct
- Or equal roots
- Or imaginary
- Try discriminant
- See $b^2 - 4ac$

TYPE
- Type check
- Yes if > 0
- Perfect square = 0
- Else imaginary

QUICK STEPS:

D BOSS
* D > 0: Two real roots
* D = 0: Equal roots
* D < 0: Imaginary roots

Where D = $b^2 - 4ac$

WORD PROBLEMS

Mnemonic: "STORY TIME"

STORY
- See what's given
- Take variable x
- Organize data
- Relations make
- Yes equation form

TIME
- Try methods
- Important data
- Make equation
- Everything check

PROBLEM STEPS:

PAPA METHOD
1. Pick variable
2. Algebraic form
3. Put conditions
4. Apply methods

EXAMPLES:
* Area = length × width
* If length = x
* Width = x + 2
* Area = x(x + 2)

: APPLICATIONS

Mnemonic: *"DAILY LIFE"*

D
A
I
L
Y
- Distance problems
- Area related
- Interest sums
- Length width
- Yearly growth

L
I
F
E
- Life examples
- Important cases
- :Find solutions
- Easy relate

COMMON TYPES

AREA TIME

1. Area problems:
   * Rectangle
   * Square
   * Circle

2. Number problems:
   * Consecutive
   * Product/Sum
   * Age related

QUICK REVISION CHECKLIST

Before Exam:

- ✅ Standard form check
- ✅ Method selection
- ✅ Formula recall
- ✅ Nature of roots
- ✅ Word problems
- ✅ Applications
- ✅ Verification

Scoring Tips: 100%
1. Show all steps
2. Write proper method
3. Check both roots
4. Verify in equation
5. Draw diagrams if needed

HIGH FOCUS AREAS
1. Formula Method (5 marks)
2. Word Problems (5 marks)
3. Standard Form (5 marks)
4. Nature of Roots (4 marks)
5. Applications (4 marks)

PROBLEM SOLVING TIPS

Mnemonic: *"SOLVE KARO"*

S
O
L
V
E
- Standard form first
- Organize terms
- Look for method
- Verify roots
- Equation check

K
A
R
O
- Keep checking steps
- All terms included
- Roots verify
- Order maintain

GOOD LUCK!