



NDA TRICKS & TIPS

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1. NDA EXAM SNAPSHOT

- Written exam: Mathematics 300 marks + GAT 600 marks; 2.5 hours per paper.
- SSB Test/Interview: 900 marks. Written exam is objective-type.
- GAT includes English plus Physics, Chemistry, General Science, History, Geography and Current Events.
- No calculator in the objective papers. Practise estimation and mental arithmetic.
- Use the latest UPSC notification for final exam rules, syllabus and marking details.

2. ARITHMETIC & ALGEBRA

- Percent change = $(\text{change} / \text{original}) \times 100$.
- If ratio is $a:b$ and total is T , shares are $aT/(a+b)$ and $bT/(a+b)$.
- For $ax^2+bx+c=0$: sum of roots = $-b/a$; product = c/a .
- Discriminant $D = b^2 - 4ac$: $D>0$ two real roots; $D=0$ equal roots; $D<0$ no real roots.
- For inequalities, move all terms to one side, factor, then test one value in each interval.
- Check denominators and square-root conditions before accepting a solution.

3. AP, GP & LOGARITHMS

- AP: n th term = $a+(n-1)d$; sum = $n/2 [2a+(n-1)d]$.
- GP: n th term = $ar^{(n-1)}$; finite sum = $a(r^n-1)/(r-1)$, $r \neq 1$.
- $\log_b(xy) = \log_b x + \log_b y$; $\log_b(x^k) = k \log_b x$.
- Log domain: argument > 0 , base > 0 and base $\neq 1$.
- $1+2+\dots+n = n(n+1)/2$.
- Before using a sequence formula, identify first term, common difference/ratio and number of terms.

4. TRIGONOMETRY QUICK CUES

- $\sin^2 x + \cos^2 x = 1$; $1 + \tan^2 x = \sec^2 x$.
- $\sin(A+B) = \sin A \cos B + \cos A \sin B$.
- $\cos(A+B) = \cos A \cos B - \sin A \sin B$.
- $\sin 2x = 2 \sin x \cos x$; $\cos 2x = \cos^2 x - \sin^2 x$.
- Remember key angles: 0, 30, 45, 60, 90 degrees. Make a small value table from memory.
- Draw a right triangle for height-and-distance questions; mark the angle and opposite/adjacent sides.

5. MATRICES & DETERMINANTS

- For $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$, determinant = $ad-bc$.
- A inverse = $\text{adj}(A)/\det(A)$, only if $\det(A) \neq 0$.
- If $\det(A)=0$, the square matrix is singular and has no inverse.
- For two equations: use Cramer's rule only when the coefficient determinant is non-zero.
- Keep row and column order consistent while expanding determinants.
- After solving simultaneous equations, substitute values back to verify both equations.

6. COMPLEX NUMBERS & COUNTING

- $i^2=-1$; powers of i repeat every 4: $i, -1, -i, 1$.
- For $z=a+ib$: conjugate = $a-ib$; $|z|^2 = a^2+b^2$.
- $nPr = n!/(n-r)!$; $nCr = n!/[r!(n-r)!]$.
- Permutation = arrangement (order matters); combination = selection (order does not matter).
- Binomial general term: $T_{(r+1)} = C(n,r)a^{(n-r)}b^r$.
- For counting, define what one outcome means before counting cases; avoid double-counting.



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1. COORDINATE GEOMETRY

- Distance = $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$.
- Midpoint = $((x_1+x_2)/2, (y_1+y_2)/2)$.
- Slope $m=(y_2-y_1)/(x_2-x_1)$; line: $y-y_1=m(x-x_1)$.
- Circle: $(x-h)^2+(y-k)^2=r^2$.
- Parallel lines have equal slopes; perpendicular non-vertical lines have slopes whose product is -1 .
- For conics, identify the standard form before using focus, directrix or eccentricity formulas.

2. DIFFERENTIAL CALCULUS

- $d(x^n)/dx = n x^{(n-1)}$; $d(\sin x)/dx = \cos x$; $d(\cos x)/dx = -\sin x$.
- Product: $(uv)' = u'v + uv'$; chain rule: $d[f(g(x))]/dx = f'(g(x))g'(x)$.
- Tangent at $x=a$: $y-f(a)=f'(a)(x-a)$.
- For maxima/minima, find critical points from $f'(x)=0$ and check sign/second derivative.
- If a question asks increasing/decreasing intervals, study the sign of the first derivative.
- Differentiate your final expression mentally or on rough paper to catch common mistakes.

3. INTEGRATION & DIFFERENTIAL EQNS

- Integral $x^n dx = x^{(n+1)}/(n+1)+C$, $n \neq -1$.
- Integral $1/x dx = \ln|x|+C$; integral $e^x dx = e^x+C$.
- By parts: integral $u dv = uv - \text{integral } v du$.
- Substitution works best when the derivative of an inner expression also appears.
- Add $+C$ to indefinite integrals and use given initial conditions to find the constant.
- For separable equations, place y terms with dy and x terms with dx , then integrate both sides.

4. VECTORS & 3D

- $a \cdot b = |a||b| \cos(\theta)$; dot product is 0 for perpendicular non-zero vectors.
- $|a \times b| = |a||b| \sin(\theta)$; this gives parallelogram area.
- 3D distance = $\sqrt{(dx)^2+(dy)^2+(dz)^2}$.
- For a direction-cosine triple l, m, n : $l^2+m^2+n^2=1$.
- Sketch axes and label coordinates before using a 3D formula.
- Dot product measures alignment; cross product measures perpendicular area.

5. STATISTICS & PROBABILITY

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.
- For independent events: $P(A \cap B) = P(A)P(B)$.
- Mean = sum of observations / number of observations.
- For grouped data, use frequency-weighted mean: $\text{sum}(fx)/\text{sum}(f)$.
- Do not assume events are independent unless the question supports it.
- For probability, write the sample space and count favourable and total outcomes consistently.

6. MATHS PAPER GAME PLAN

- First pass: solve direct questions and familiar formulas; mark longer questions for later.
- Estimate the time per question and avoid spending too long on one difficult problem.
- Write the target quantity and relevant formula before substituting values.
- Check signs, units, angle mode, domain, roots and end points.
- Practise without a calculator; speed comes from accuracy with standard results.
- After a mock, label each error: concept, formula, calculation, reading or time management.



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1. ENGLISH: GRAMMAR & USAGE

- **Subject-verb agreement:** "Each of the students is..."; the main subject controls the verb.
- **Tense consistency:** keep the time frame clear unless the meaning changes.
- Articles: a/an for non-specific singular count nouns; the for a specific or already identified noun.
- Prepositions are often tested as fixed phrases: learn them in context, not as isolated guesses.
- In sentence correction, check grammar, meaning and concision together.
- For comprehension, answer from the passage; do not add facts from memory.

2. VOCABULARY & COMPREHENSION

- Use context clues: contrast words (but, however) and cause words (because, therefore) guide meaning.
- For a new word, learn meaning + synonym/antonym + one example sentence.
- In cloze tests, read the full sentence before selecting a word.
- For rearrangement, find opening statements, pronoun references and logical connectors.
- Eliminate options that are grammatically possible but do not fit the passage meaning.
- Keep a vocabulary notebook and revise it briefly every day.

3. PHYSICS & CHEMISTRY GAT

- Physics focus: units, motion, force, work-energy, heat, sound, light, electricity and magnetism.
- Chemistry focus: states of matter, elements/compounds, mixtures, atoms, acids/bases/salts and everyday chemistry.
- Learn definitions with units: pressure, density, power, frequency, voltage and resistance.
- **Density = mass/volume; speed = distance/time; power = work/time.**
- **Ohm's law: $V=IR$; electrical power $P=VI=I^2R=V^2/R$.**
- Use dimensional sense to reject impossible options; memorise formulas with conditions and units.

4. GENERAL SCIENCE

- Revise basic Biology: cells, tissues, organs, nutrition, respiration, blood, immunity and ecology.
- Separate similar terms: mass vs weight, heat vs temperature, speed vs velocity, element vs compound.
- For a science fact, connect definition + function + example rather than memorising a loose line.
- Make one-page comparison tables for systems, instruments, discoveries and common applications.
- Practise mixed MCQs; switching between topics is part of the GAT challenge.
- Read diagrams and labels in school-level science books carefully.

5. HISTORY, POLITY & GEOGRAPHY

- History: build a timeline; link event, leader, place and outcome.
- Polity: learn constitutional basics, Parliament, President, Prime Minister, courts and fundamental rights/duties.
- Geography: revise maps, rivers, mountains, climate, soils, crops, minerals and neighbouring countries.
- Use map practice for location questions and compare similar features in a table.
- For chronology questions, arrange dates or eras before looking at options.
- Prefer standard school texts and trustworthy official sources for facts.

6. CURRENT EVENTS & FINAL STRATEGY

- Review major national and international events, defence exercises, awards, sports and science developments.
- Make short weekly notes: what happened, where, who was involved and why it matters.
- Attempt timed mixed sets for both papers; review every wrong and guessed answer.
- Avoid blind guessing: check the latest UPSC notice for the applicable negative-marking rule.
- Sleep well before the exam and carry only permitted items.
- Remember: Mathematics and GAT both matter; prepare to your strengths, but do not ignore either paper.