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ACT Guide

Tips and Formulas

- ✓ Tips and tricks to improve your score
- ✓ Strategies for questions
- ✓ Formulas for math sections

ACT Strategies to Reach Your Target Score

ACT Test-taking tips

Tips for managing your time on the ACT:

1. Start at the beginning, but don't be afraid to skip questions
2. Remember that each question is worth the same amount
3. Use formulas and let your calculator work for you in the math section
4. Set and follow an answering pace
5. Revisit unanswered questions; there is no penalty for wrong answers, so always give your best guess!

Strategy for multiple-choice questions:

1. Read the entire question
2. Anticipate the answer
3. Focus on key terms or concepts, highlighting or underlining as possible/if needed
4. Eliminate clearly wrong answers
5. Consider all possible answers

How to spot incorrect answer options

- Very similar to other answer options
- Off-topic
- Contain qualifiers (e.g. sometimes, often, perhaps, may, generally, usually) or absolutes (e.g. always, never, not, only)

How to spot correct answer options

- Longer or more detailed than others
- Worded similarly to the question

ACT English tips

ACT English tips: Strategies for rhetorical skills

- Read the question carefully. Key words like "why" and "how" can guide you to the best answer
- Avoid wordiness. Look for concise phrasing that answers the exact question asked.
- Determine the appropriate question context. Focus on the relevant portion of text to select your response.
- "Hear" the sentence in your head. Answer style questions by paying attention to word order, extra words, and missing words.

ACT English tips: Grammar rules

You can prepare to ace this section by understanding these grammar concepts:

- Independent vs. dependent clauses
- Apostrophe for possessives vs. plurals
- Subject-verb agreement
- Correct verb tense
- Sentence mechanics

ACT Math tips

- **Memorize and practice** using formulas from this sheet
- **Read each question** carefully before you start to solve it
- **Show your work** to catch incorrect answers
- **Use your calculator** to save time
- **Substitute real numbers** into variables if you get stuck
- **Move on** if you can't answer a question; you can return later

ACT Reading tips

You can prepare to ace this section by understanding these reading concepts:

1. Identify the type of writing
2. Spot key words, phrases, and literary or rhetorical devices
3. Determine what the question is asking
4. Eliminate any obviously wrong answers
5. Look for possible distractors and remove
6. Examine the wording of remaining answers
7. Try a true/false test on your top response choices

ACT Science tips

The ACT Science section tests your scientific reasoning skills.

1. **Skim** the passage, graph, or chart
2. **Review** questions to understand what information you need to find
3. **Scan** the passage again to locate key information to answer the questions.

ACT Writing tips

The ACT writing section involves writing an essay on a given issue, addressing three stated perspectives and presenting your own opinion. Your essay will be scored based on completeness and argument quality.

- **Plan your response before beginning to write:**
  - List all relevant information
  - Plan arguments both for and against each of the three viewpoints
- **Organize your response:**
  - Write an introduction
  - Include at least one paragraph to describe each main point
  - Add a conclusion to sum everything up
- **Proofread:**
  - Correct errors
  - Check prompt is answered

Formulas

Three types of central tendency:

- **Mean:** sum of all the values divided by the number of values.
- **Median:** the median is the middle value after ordering values in size, order. If there are two middle values, calculate the mean of them.
- **Mode:** the value that occurs most often.

Circle formulas:

- **Circumference:** $C = \pi d \text{ or } C = 2\pi r$
- **Area:** $A = \pi r^2$
- **Area of a sector:** $\frac{\theta}{360^\circ} = \frac{Area}{\pi r^2}$
- **Arc length:** $\frac{\theta}{360^\circ} = \frac{Arc\ length}{2\pi r}$

Areas and volumes:

- **Area of a trapezoid:** $A = h \times \frac{a+b}{2}$
- **Area of a parallelogram:** $A = b \times h$
- **Volume of a prism:** $V = h \times B$ (where B is the base area)
- **Volume of a cone:** $V = \frac{\pi r^2 h}{3}$
- **Volume of a sphere:** $V = \frac{4\pi r^3}{3}$

Area of a right triangle: $A = \frac{1}{2} \times base \times height$

Pythagorean theorem: $a^2 + b^2 = c^2$

SOHCAHTOA: $sin\theta = \frac{O}{H},\ cos\theta = \frac{A}{H},\ tan\theta = \frac{O}{A},$

Sine law: $\frac{sin\ A}{a} = \frac{sin\ B}{b} = \frac{sin\ C}{c}$

Cosine law: $c^2 = a^2 + b^2 - 2ab\ cos\theta$

Area of non-right triangles: $A = \frac{1}{2}ab\ sinC$

Trigonometric identities:

- $\frac{sin\ x}{cos\ x} = tan\ x$
- $sin^2x + cos^2x = 1$
- $1 + cot^2x = csc^2x$
- $tan^2x + 1 = sec^2x$

Slope of a graph: $m = \frac{\Delta y}{\Delta x}$

Equation of a line: $y = mx + b$

Midpoint formula: $Midpoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Graph of a circle: $(x - h)^2 + (y - k)^2 = r^2$

Graph of an ellipse: $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$

Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Exponent laws:

- $x^a \times x^b = x^{(a+b)}$
- $x^a \div x^b = x^{(a-b)}$
- $(x^a)^b = x^{ab}$
- $\sqrt[b]{x^a} = x^{\frac{a}{b}}$

FOIL and factoring:

FOIL stands for **First, Outside, Inside, Last.**

Example: $(x + a)(x + b) = x^2 + bx + ax + ab$

Log laws:

- $log_ab + log_ac = log_abc$
- $log_ab - log_ab = log_a\frac{b}{c}$
- $log_bx^a = alog_bx$
- $log_aa = 1$
- $log_a1 = 0$
- $log_ba = \frac{loga}{logb}$
- $x^{log_xa} = a$
- $log_{a^b}a^c = \frac{c}{b}$

Probability:

$$Probability = \frac{Number\ of\ Wanted\ Outcomes}{Total\ Number\ of\ Possible\ Outcomes}$$

Sequences and series:

Arithmetic sequences	Geometric sequences
$t_n = a + (n-1)d$	$t_n = ar^{n-1}$
$S_n = \frac{n}{2}(2a + (n-1)d)$	$S_n = \frac{a(r^n - 1)}{r - 1}$