



The Five Most Common Mistakes on the SAT and ACT

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Mistakes Are Significant

- SAT: 1 question \approx 10 points on 200-800 scale
- ACT: 1 question \approx 1 or 2 points on 1-36 scale

Raw Score	Critical Reading Scaled Score	Math Scaled Score
45	590	670
44	580	660
43	580	650
42	570	640
41	560	630
40	560	620
39	550	610
38	540	600
37	540	590
36	530	580
35	520	570
34	520	570
33	510	560
32	510	550

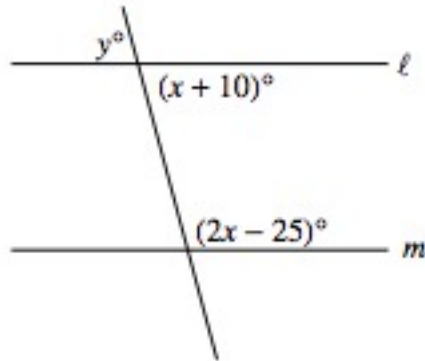
Scale Score	Test 1 English	Test 2 Mathematics
36	75	59-60
35	73-74	57-58
34	71-72	55-56
33	70	54
32	69	53
31	68	52
30	67	50-51
29	66	49
28	64-65	47-48
27	62-63	45-46
26	60-61	43-44

Root Causes of Mistakes

- Lack of familiarity with content
- Failure to read carefully
- Assumption that questions are like the ones in high school classes
- Nervousness/time stress

Mistake #1

SAT



16. In the figure above, $\ell \parallel m$. What is the value of y ?

- Students likely to write

$$x + 10 + 2x - 25 = 180$$

$$3x - 15 = 180$$

$$3x = 195$$

$$x = 65$$

- Forget the problem asks for y
- One-step solutions common in

ACT

9. In the standard (x,y) coordinate plane, point M with coordinates $(5,4)$ is the midpoint of \overline{AB} , and B has coordinates $(7,3)$. What are the coordinates of A ?

- A. $(17, 11)$
- B. $(9, 2)$
- C. $(6, 3.5)$
- D. $(3, 5)$
- E. $(-3, -5)$

- Students likely to find the midpoint of M and A , which turns out to be answer choice C
- Why? Students are used to being given endpoints and being asked for the midpoint
- There will always be “right” wrong answers to catch the careless student

Solution #1

- Awareness!
 - Students must be told that the SAT and ACT are not “normal” tests
- Encourage careful review of problem *before answering and moving on*
 - Have students underline the quantity or value requested in the wording of the problem

Mistake #2

SAT

20. The author argues that copepods “don’t like prey that flashes” (line 27) because they

- (A) are confused by the lights
- (B) want to avoid detection by predators
- (C) rarely encounter luminescence
- (D) know that luminescent animals taste bitter
- (E) are temporarily blinded by the flashes

They don’t like prey that flashes. Grab it, it explodes into light in their scratchy little arms, and they drop it. An odd bit of behavior, really, because the alga, so far as we know, doesn’t taste nasty, or sting, or do anything unpleasant to the predator, and you might reasonably expect the copepod to habituate to the flashes after a few tries. But it does not, apparently, and since practically every animal that has ever been studied habituates to stimuli that repeatedly prove harmless, there must be some other explanation. The most likely possibility is that the copepod itself wishes to remain invisible. Chomp down the alga, and the unfortunate copepod would be, for a while, lit up by the glow in its gut, a sitting target for a fish or anyone else with a taste for seafood.

- Students assume answers are right where line references point
- Answer can be several lines away
- Students end up picking anything

ACT

32. According to the fifth paragraph (lines 35–45), studies have shown that the insertion of acupuncture needles into acupoints causes nerve stimulation that results in:

- F. signals being sent to the brain and pituitary gland, which leads to the release of chemicals.
- G. signals being sent to the spinal cord, which immediately blocks the release of chemicals.
- H. chemicals being released that amplify signals to the spinal cord.
- J. chemicals being released that numb the spinal cord and prevent signals being sent to the brain and pituitary gland.

That stimulation, researchers believe, sends impulses up the spinal cord to a relatively primitive part of the brain known as the limbic system, as well as to the mid-brain and the pituitary gland. Somehow this signaling leads to the release of endorphins and monoamines, chemicals that block pain signals in the spinal cord and the brain.

- Information will always be directly in the passage
- Similarly worded answer choices work to confuse and overwhelm students under time pressure
- Details can be obscure

Solution #2

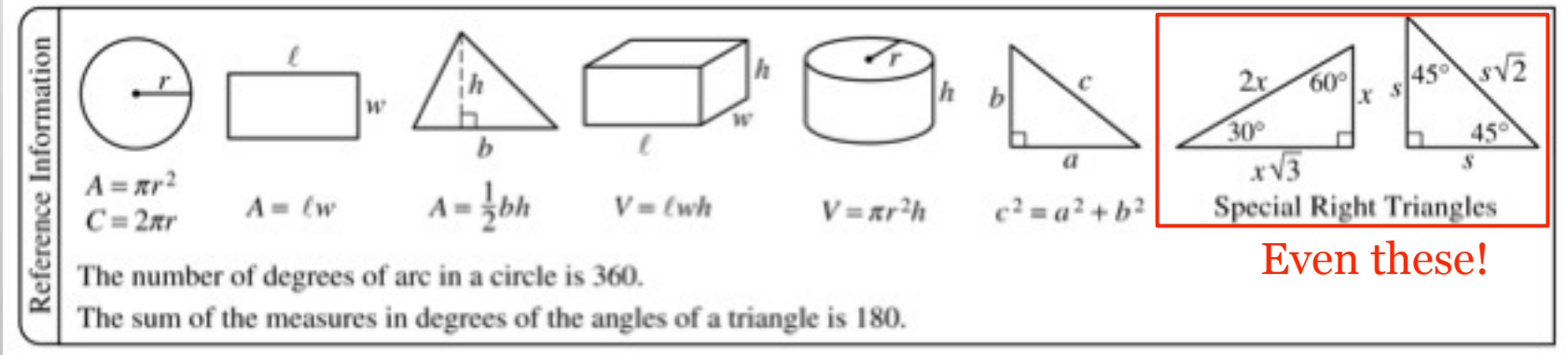
- Read carefully!
 - Pay attention to word order, and *exactly, not approximately* what the reading is saying
- Read more than you think you have to!
 - Students are used to getting an answer in a single line, right where they expect it
 - Sometimes, necessary main idea is somewhat removed from the line reference
 - Don't pick anything that “sounds good” without substantiating it with specifics

Mistake #3

SAT

Formulas on the first page of *every mathematics section*

Reference Information



$A = \pi r^2$
 $C = 2\pi r$

$A = \ell w$

$A = \frac{1}{2}bh$

$V = \ell wh$

$V = \pi r^2 h$

$c^2 = a^2 + b^2$

Special Right Triangles

Even these!

The number of degrees of arc in a circle is 360.
The sum of the measures in degrees of the angles of a triangle is 180.

- Students barely use them, because they don't remember they're there.

ACT

No formal list of formulas.

Some are given most of the time:

- Law of Sines and Law of Cosines
- Less common volume formulas

Solution #3

- The broken record method
 - Keep letting students know that they have formulas at their disposal in the SAT
 - Make sure students know they must have formulas memorized for the ACT
- Students should know common plane geometry and coordinate geometry formulas for ACT
 - Make sure they know how to use them too!

Mistake #4

SAT: The Truth About Omitting

Scenario: Student A

- Math
 - 54 questions total
 - 40 correct (C)
 - 0 incorrect (I)
 - 14 omit
 - Raw score = $C - .25 * I$
 - $40 - (.25 * 0) = 40$
 - **Scaled score = 620**

Scenario: Student B

- Math
 - 54 questions total
 - 40 correct (C)
 - 14 incorrect (I)
 - 0 omit
 - Raw score = $C - .25 * I$
 - $40 - (.25 * 14) = 36.5 = 37$
 - **Scaled score = 580**

- These scores aren't really statistically different (they're within the ± 40 -point range designated by The College Board. Why omit so many?!
- **Student B is a *worst case guessing scenario* – even *random guessing* yields an expected result of $(1/5) * 14 =$ almost 3 more questions correct!
 $43 - (.25 * 11) = 40.25 = 40 \text{ raw} = 620 \text{ scaled!}$
- When students eliminate answer choices and make *informed* guesses, they can expect to gain even more

ACT: The Truth About Omitting

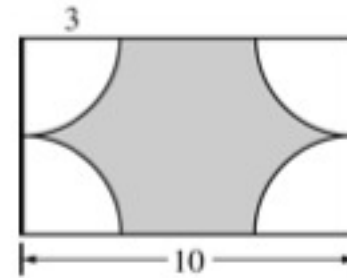
**Students cannot lose points for
incorrect answers on the ACT**

NEVER OMIT on the ACT

Guess randomly if necessary

Solution #4

- For the SAT
 - Students should make *informed* guesses whenever possible – **it pays to guess**
 - Example
 - After marking up and recalling shaded area strategy (whole area minus white area), most students know the area of the whole rectangle is 60, so answers can be narrowed to (D) and (E)
 - Omitting should be a **last resort**
 - Informed guessing is possible



9. In the rectangle above, the radius of each quarter circle is 3. What is the area of the shaded region?

- (A) $16 - 3\pi$
- (B) $16 - 9\pi$
- (C) $32 - 9\pi$
- (D) $60 - 3\pi$
- (E) $60 - 9\pi$

After some thinking, this problem is at worst a 50/50 shot

Mistake #5

SAT

16. For how many integers n is $(2n + 1)(3n - 11)$ a negative number?
- (A) None
 - (B) One
 - (C) Two
 - (D) Three
 - (E) Four

- Intimidating math problem
- There's no "set method" or "formula" to fall back on
- Students end up leaving blank or randomly guessing

ACT

27. A student claimed that polycarbonate is more dense than PA-6. Do the results of Experiments 1–3 support his claim?
- A. No, because in Liquid 8, polycarbonate stayed at the bottom and PA-6 rose.
 - B. Yes, because in Liquid 8, polycarbonate stayed at the bottom and PA-6 rose.
 - C. No, because in Liquid 8, polycarbonate rose and PA-6 stayed at the bottom.
 - D. Yes, because in Liquid 8, polycarbonate rose and PA-6 stayed at the bottom.

- "Sciencey" words and terms can be overwhelming
- Easy to jumble information
- Students get discouraged quickly and lose confidence

Solution #5

- Encourage students to do *something*
 - Plug numbers in
 - Use answer choices to work backwards
- Fear of being wrong must be overcome
 - More than half the time, inertia is the problem
 - When students can't see the endpoint immediately, they lose confidence
 - Encourage taking possible first step – will lead to a solution much of the time

Summary

- Mistakes are costly, but preventable
- Resolving even one or two of the five discussed would constitute major progress
- Most important factor: experience
 - Learning from mistakes
 - Learning to spot tricky scenarios
 - Learning to play the structure of the test correctly