GMAT ▶ FLASHCARDS

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from the Founder

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VERBAL ▶ SENTENCE CORRECTION FLASHCARDS

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VERBAL ▶ SENTENCE CORRECTION

"Agree"

Agree <u>with</u> another person.

CORRECT: "I agree <u>with</u> Joey on this issue."

Agree <u>to</u> or <u>upon</u> something inanimate.

CORRECT: "I agree <u>to</u> your proposal."

CORRECT: "A course of action was agreed <u>upon</u>."

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VERBAL ▶ SENTENCE CORRECTION

"Just as"

"Just as" can replace "in the same way that".

CORRECT: "Just as Elvis changed the face of rock n' roll, Hawking changed the face of astrophysics."

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VERBAL ▶ SENTENCE CORRECTION

Idiom

"In contrast to"

CORRECT: "<u>In contrast to</u> most parents, Jimmy's parents let him stay out all night."

"Similar to"

CORRECT: "Theresa's parenting style is <u>similar to</u> Christine's."

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VERBAL ▶ SENTENCE CORRECTION

"Whether" vs. "If"

"Whether" is correct when a sentence describes alternatives.

CORRECT: "<u>Whether</u> to vote or not."

"If" is correct when a sentence describes a hypothetical situation.

CORRECT: "<u>If</u> he were to participate, he would…"

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VERBAL ▶ SENTENCE CORRECTION

"rather than"

Use "rather than" to express a preference.

CORRECT: "I would prefer nonfat milk <u>rather than</u> cream in my coffee."

VERBAL ▶ SENTENCE CORRECTION

"Due to"

The best meaning for "due to" is "caused by."

- "Due to" should not be used to mean "on account of".

INCORRECT: "The game was postponed <u>due to</u> rain."

CORRECT: "The game was postponed <u>on account of</u> rain."

CORRECT: "The game's postponement was <u>due to</u> rain."

VERBAL ▶ SENTENCE CORRECTION

"not…but"

Use "not…but" to join linguistically equivalent (parallel) things.

CORRECT: "Blake is <u>not</u> a golfer <u>but</u> a tennis player."

VERBAL ▶ SENTENCE CORRECTION

Pronoun Errors

Ambiguous pronoun reference - each pronoun must agree in number with the noun it replaces

INCORRECT: "<u>Fred and Vijay</u> went to the soccer match, but <u>he</u> said that he liked cricket better."

Singular/Plural noun agreement - each pronoun must refer directly and unambiguously to the noun it replaces

INCORRECT: "The average <u>dentist</u> expects patients to be on time, and <u>they</u> are usually mistaken."

VERBAL ▶ SENTENCE CORRECTION

Ambiguous Gerundial Clauses, 1 of 2

INCORRECT: "Driving to a holiday dinner, <u>Fred's wallet</u> was lost."

This sentence implies Fred's wallet drove to a holiday dinner. One way to fix example above: Rearrange sentence order and alter second half of sentence so that inanimate object does not refer to action verb in first half of sentence.

CORRECT: "Fred lost his wallet as he drove to a holiday dinner."

VERBAL ▶ SENTENCE CORRECTION

Ambiguous Gerundial Clauses, 2 of 2

INCORRECT: "Driving to a holiday dinner, <u>Fred's wallet</u> was lost."

Another way to fix example above: Change first half of sentence into adverbial clause, which clarifies the subject of the sentence that is in the second phrase.

CORRECT: "While driving to a holiday dinner, Fred lost his wallet."

VERBAL ▶ SENTENCE CORRECTION

Parallel Construction

A signal that you may have a parallel construction error is a group of phrases set off by commas.

Spot this problem by:

- Finding a series of actions, lists, or sentences divided into parts.
- Make sure that each list item has similar structure (i.e., no one part of the list is distinct from the others in terms of grammatical construction or length).

VERBAL ▶ SENTENCE CORRECTION

Verb Tense

A sentence that begins in one tense should generally stay in that tense.

- Often related to parallel construction questions.

EXCEPTION: Past perfect (ex: "had/have + verb"). An action set in the past perfect must have another action that comes after it set in the simple past.

CORRECT: "Bob <u>was fired</u> after he <u>had worked</u> at the company for only two weeks."

VERBAL ▶ SENTENCE CORRECTION

Common Word Trap

Politics – Singular word

CORRECT: "Politics is not for the faint of heart."

People – Plural word

CORRECT: "People are often confused about grammatical issues that arise on the GMAT."

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VERBAL ▶ SENTENCE CORRECTION

Avoid Apples to Oranges Comparisons

Compare nouns to like nouns:

CORRECT: "The roses at Sarah's wedding were prettier than the orchids at Jane's wedding."

INCORRECT: "I enjoy reading the poems of Kenneth Koch more than Emily Dickinson."

Compare actions to like actions:

CORRECT: "Beeswax candles burn more cleanly than synthetic candles."

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VERBAL ▶ SENTENCE CORRECTION

Quantity Words and Idioms

CORRECT: "On the flight to Chicago, Betty had to choose between two drink options."

CORRECT: "On the flight back to New York, Betty had to choose among three dinner options."

Countable Items:	Non-Countable Items:
• Fewer	• Less
• Number	• Amount, quantity
• Many	• Much

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VERBAL ▶ SENTENCE CORRECTION

Correct Sentences

20% of SC sentences are correct as presented in the first instance on the GMAT.

• This is approximately three questions per test.

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VERBAL ▶ SENTENCE CORRECTION

3-Step Method

1. Read original sentence carefully.
2. Scan answer choices for differences that help identify commonly-tested errors.
3. Eliminate a choice as soon as you find an error.

   TIP: If you narrow a question down to two possible "candidate" sentences, read each one slowly and deconstruct each part of the sentence until an error jumps out at you.

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VERBAL ▶ SENTENCE CORRECTION

Collective Nouns that are Singular

Beware collective nouns which are actually singular: "audience, committee, everyone" merit singular verbs

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VERBAL ▶ SENTENCE CORRECTION

Misplaced or Dangling Modifiers

Modifiers should be as close as possible to the word or clause they modify.

INCORRECT: "Sarah Jane rarely sparked interest in men, though not a plain girl."

CORRECT: "Sarah Jane, though not a plain girl, rarely sparked interest in men."

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VERBAL ▶ SENTENCE CORRECTION

Either...or / Neither...nor

Verbs agree with whatever follows "or/nor"

CORRECT: "Neither the musicians nor the conductor is from Dallas."

CORRECT: "Neither the conductor nor the musicians are from Dallas."

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VERBAL ▶ SENTENCE CORRECTION

Gerunds (words that end with "ing")

When the GMAT gives you a choice between one verb tense that uses an "ing" form and another that does not, usually the "ing" form is wrong.

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VERBAL ▶ SENTENCE CORRECTION

Verb Tense – 3 Tips

1. Make sure that the verb tense you choose properly reflects the sequence of events.

2. Use Present Perfect (verb + "ing") to emphasize continuing nature of an action or that two or more actions are occurring simultaneously.

   CORRECT: "I have been correcting Raul's GMAT grammar constantly."
   "I was walking and chewing gum when I collided with a lamppost."

3. Avoid Passive Voice. Use simple past tense instead of "had" + past tense.

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VERBAL ▶ SENTENCE CORRECTION

"so…as to"

Use "So [ADJECTIVE] as to [VERB]" as a comparator.

   CORRECT: "Her debts are so extreme as to threaten her company."

Do not use it to substitute for "in order to"

   INCORRECT: "He exercises everyday so as to build his stamina."

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VERBAL ▶ SENTENCE CORRECTION

Like Things

Compare like things only (ex: nouns to nouns, people to people, actions to actions, etc).

Comparison words: "like, as, compared to, less than, more than, other, that of, those of".

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VERBAL ▶ SENTENCE CORRECTION

"like, such as"

"like" = "similar to"

> **CORRECT:** "Her graceful comportment made her seem like a dancer, although she had never set foot on a stage."

"such as" = "for example"

> **CORRECT:** "I enjoy activities such as skydiving, heliskiing and scuba diving."

VERBAL ▶ SENTENCE CORRECTION

Guessing

When in doubt, choose the most concise (shortest) answer.

VERBAL ▶ SENTENCE CORRECTION

Idioms involving "as"

Memorize:

- "regarded as" (don't use "to be")
- "as long as"
- "such questions as"
- "plays as"

VERBAL ▶ SENTENCE CORRECTION

"None, No one"

"None" should be singular, even when to your ear it seems as though it should be plural.

> **CORRECT:** "None of the boys enjoys camping as he does."

"No one" is always singular.

> **CORRECT:** "No one enjoys camping as much as he does."

VERBAL ▶ SENTENCE CORRECTION

Passive vs. Active Verb Tense

Avoid passive verb tenses! These are usually present or past perfect forms of verbs.

- "Have/Had + VERB + -ing" is rarely the correct choice.
- Active tense is preferred in sentence correction questions.
- "By" is often an indication of the passive voice.

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VERBAL ▶ SENTENCE CORRECTION

"Compare"

"Compare to" compares UNLIKE things, whereas "compare with" compares LIKE things. "Compare to" is used to stress resemblance.

CORRECT: "She compared the evening gown to the cocktail dress. "

"Compare with" can be used to show either similarity or difference (usually difference).

CORRECT: "When compared with Laura's work product, Jim's showed a world of difference."

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "Concern"

"Concerned for" = "worried, anxious"

CORRECT: "I am concerned for her safety."

"Concerned with" = "related to"

CORRECT: "This matter is concerned with the Smith case."

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "to be"

CORRECT: "Likely to be"

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "same to…as to"

CORRECT: "Same to X as to Y"

VERBAL ▶ SENTENCE CORRECTION

"Greater than, More than"

"Greater than" is appropriate when describing numbers alone.

CORRECT: "Greater than 100…"

"More than" should be used when describing the numbers of objects or when making comparisons.

CORRECT: "More than 100 fish."

VERBAL ▶ SENTENCE CORRECTION

Idiom: "rates for"

When "rates" refer to the price charged, it should be followed by "for"

CORRECT: "Rates for telephone service have increased in recent years."

VERBAL ▶ SENTENCE CORRECTION

Coordination, Subordination

Coordination (comma + coordinating word/conjunction)

- Equal emphasis with independent clauses
- "and, or, but, for, nor, yet, so"

Subordination (placed before or after independent clause with comma)

- Emphasize other part with one independent clause and one dependent clause
- "although, while, since"

VERBAL ▶ SENTENCE CORRECTION

Pronoun

A pronoun must:

- Agree with its antecedent in number (plural vs singular) and gender
- Refer to a specific antecedent without ambiguity

Remember: "that" is singular and "those" is plural

VERBAL ▶ SENTENCE CORRECTION

Participles

Participles are sentence fragments. They are often adjectives formed from verbs. They are often grammatically ambiguous, and cause problems due to this ambiguity.

CORRECT: "Peter, <u>distracted</u> by his cat and <u>wanting</u> to do his work…"

VERBAL ▶ SENTENCE CORRECTION

"Less"

Less is a word used to describe non-count nouns, but also used for sums of money, periods of time and distance, and citations of numerical/statistical data.

CORRECT: "It's <u>less</u> than 35 miles to San Francisco."

CORRECT: "We spent <u>less</u> than $100."

CORRECT: "The town spent <u>less</u> than 95% of its budget."

VERBAL ▶ SENTENCE CORRECTION

Passive Voice

The passive voice is not grammatically incorrect, but the GMAT usually considers it stylistically inferior to the active voice.

- Eliminate passively worded choices if there is a grammatically correct alternative in the active voice.

VERBAL ▶ SENTENCE CORRECTION

"One of the…"

"One of the [PLURAL NOUN] that/who [PLURAL VERB]"

CORRECT: "He is <u>one of</u> the persons who <u>bake</u> spectacular cakes."

"Only one of the [PLURAL NOUN] that/who [SINGULAR VERB]"

CORRECT: "He is the <u>only one of</u> the employees who <u>was</u> promoted."

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VERBAL ▶ SENTENCE CORRECTION

"Consider"

When "consider" means "regard as," "as" should not be present with "consider" in the sentence. "Consider" is also not followed by an infinitive like "to be".

INCORRECT: "Scientists <u>consider</u> control factors <u>to be</u> an integral element…"

CORRECT: "Scientists <u>consider</u> control factors an integral element…"

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "Deciding that…"

CORRECT: "<u>Deciding that</u> the best course was to continue, the Donner Party fatefully elected to forge ahead."

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "just as…so"

Make sure elements are parellel.

CORRECT: "<u>Just as</u> gills are to fish, <u>so</u> lungs are to humans."

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "not so much…as"

CORRECT: "Not so much to show Jane up as to make her appear foolish, Sarah pointed out Jane's error to their supervisor."

VERBAL ▶ SENTENCE CORRECTION

Strategy

Some test prep sources claim that when the entire sentence is underlined in the question, the answer has a higher probability of being 'D' or 'E'.

VERBAL ▶ SENTENCE CORRECTION

Verb Phrase Ellipsis

Most of the time when we use a comparison using "than" or "as", we omit verb comparators, as they are implied.

CORRECT: "He is shorter than she."
(Note the omission of "is" at the end.)

CORRECT: "He is as depressed as they, but he soldiered onward anyway."
(Note the omission of "are".)

VERBAL ▶ SENTENCE CORRECTION

Idiom: "Forbid" vs. "Prohibit"

"X forbids Y to do Z."

CORRECT: "Sarah's father forbids her to date Josh."

"X prohibits Y from [VERB + ing]."

CORRECT: "Sarah's father prohibited Sarah from going out with Josh."

VERBAL ▶ SENTENCE CORRECTION

Singular or Plural

The following are always plural pronouns when used as the subject of a sentence:

- Some
- More
- Most
- All

VERBAL ▶ SENTENCE CORRECTION

Idiom

"For" = "despite"
"Along with" = "in addition to"

VERBAL ▶ SENTENCE CORRECTION

"Compare"

Use "compare to" for unlike things

CORRECT: "He compared her to an evil shrew."

Use "compare with" for like things

CORRECT: "The paralegal compared the copied signature with the original."

VERBAL ▶ SENTENCE CORRECTION

Comparison Words

"Like" used to express similarity, normally between two nouns

CORRECT: "Tangerines are like mandarins."

"As" normally used to compare two clauses including verbs, NOT just two nouns

CORRECT: "He looks as though he is drunk."

"Such as" normally used to give examples.

CORRECT: "Investment banking has taught me skills such as discounted cash flow modeling."

VERBAL ▶ SENTENCE CORRECTION

"Each"

"Each" is usually singular. Exception: when "each" follows a plural subject, the verb and subsequent pronouns remain in the plural.

CORRECT: "Three cats each <u>chase</u> birds."

CORRECT: "Three cats, each of which <u>chases</u> birds…."

VERBAL ▶ SENTENCE CORRECTION

"Number"

A "number" requires a plural verb.

CORRECT: "<u>A number</u> of people <u>are</u> queuing to enter the Tate."

"The number" requires a singular verb.

CORRECT: "<u>The number</u> of people in line <u>is</u> decreasing."

VERBAL ▶ SENTENCE CORRECTION

Pronoun

When you see any pronoun, especially "it" or "they", immediately check the antecedent.

VERBAL ▶ SENTENCE CORRECTION

Idiom: "so [adj.]…as to be [adj.]"

CORRECT: "He was <u>so</u> jovial <u>as to be</u> practically silly."

VERBAL ▶ **SENTENCE CORRECTION**

Infinitives to Avoid

"To include" is usually incorrect,
while "including" is more often correct.

"To implement" is usually incorrect,
while "implementing" is more often correct.

VERBAL ▶ **SENTENCE CORRECTION**

Idiom: "just as…, so too…"

CORRECT: "Just as stealing is frowned upon, so too
is cheating."

VERBAL ▶ **SENTENCE CORRECTION**

"Majority"

"Majority" should be used with count nouns only.

INCORRECT: "The majority of the talk…"

CORRECT: "The greater part of the talk…"

CORRECT: "The majority of the people…"

VERBAL ▶ **SENTENCE CORRECTION**

Pattern to Avoid

Avoid any sentence construction with:
"[PREPOSITION] [NOUN] [PARTICIPLE]"

INCORRECT: "…with shower facilities included."

VERBAL ▶ SENTENCE CORRECTION

"Target to" and "Target at"

"Target to" is normally followed by the infinitive form of a verb.

CORRECT: "That's a good target to choose."

"Targeted at" is normally followed by a noun.

CORRECT: "The gun is targeted at you."

VERBAL ▶ SENTENCE CORRECTION

Idiom – Paired Coordinates

"Not X, but rather Y"

CORRECT: "It was not a bird, but rather, a plane."

VERBAL ▶ SENTENCE CORRECTION

"they"

Always be suspicious of the pronoun "they".

- A common trap is for "they" to refer to a singular subject noun.

VERBAL ▶ SENTENCE CORRECTION

Idiom: "between…and"

"Between" always goes with "and."

CORRECT: "She was between a rock and a hard place."

CORRECT: "He couldn't decide between one and the other."

VERBAL ▶ SENTENCE CORRECTION

Strategy

Whenever you narrow candidate answers to two options that are both grammatically correct, but one involves a change in meaning from the original sentence, choose the answer which preserves the uncorrected sentence's original meaning.

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VERBAL ▶ SENTENCE CORRECTION

Comparison of Actions

Watch out for comparison of actions /inanimate objects performing compared actions:

INCORRECT: "French wines taste better than Australian wines." (Implies wines are tasting.)

CORRECT: "French wines taste better than Australian wines <u>do</u>."

"French wines taste better than Australian wines <u>taste</u>."

"French wines taste better than <u>do</u> Australian wines."

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VERBAL ▶ SENTENCE CORRECTION

Gerunds (verb + "ing")

The "ing" (present participle) form introduces an action that is simultaneous with the action of the main clause.

CORRECT: "While watching for pedestrians, Jane made a left hand turn through the crosswalk."

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VERBAL ▶ SENTENCE CORRECTION

Numbers Greater than 1

Numbers greater than 1 are plural unless you are referring to the number itself.

CORRECT: "<u>Two</u> out of every three dog owners in the U.S. also <u>own</u> a cat."

CORRECT: "<u>Two is</u> my favorite prime number because it is also even."

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VERBAL ▶ **SENTENCE CORRECTION**

Idiom: "During"

"During" + "[defined TIME PERIOD]" is wrong.

INCORRECT: "During two hours, I felt sleepy."

CORRECT: "During the past two hours, I felt sleepy."

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VERBAL ▶ **SENTENCE CORRECTION**

Quantifiers

With fractions, percentages, and indefinite quantifiers, the verb should agree with main subject of the sentence, not the noun contained within the prepositional phrase.

CORRECT: "Thirteen percent of Cleveland's teens are pregnant."

NOTE: "of Cleveland's teens" is NOT the subject!

With singular or non-count nouns or clauses, use a singular verb.

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VERBAL ▶ **SENTENCE CORRECTION**

Dangling Participle

Descriptive participle phrase must be as close as possible to the noun it describes.

INCORRECT: "Sarah's camera was lost while skiing to the base." (Underlined portion is a dangling participle — it's hanging.)

CORRECT: "As she was skiing to the base, Sarah lost her camera." (Underlined portion is a clause with a subject and verb.)

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VERBAL ▶ **SENTENCE CORRECTION**

"Hopefully"

"Hopefully" is nearly always wrong on the GMAT.

• Avoid sentence choices with this word.

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VERBAL ▶ SENTENCE CORRECTION

Thinking Words

Thinking words such as "theory, belief" or "believe" are often followed by "that".

CORRECT: "Lucy's belief that the Holocaust did not occur is misguided."

INCORRECT: "Lucy's belief of…"

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VERBAL ▶ SENTENCE CORRECTION

Idiom: "Credit"

"Credit A with B": give responsibility for

CORRECT: "Bell is credited with inventing the telephone."

"Credit X to Y": give money or credit to

CORRECT: "The bank credited $4 million to his account."

"Credit for [NOUN]": money received for or in exchange for something

CORRECT: "The power customer received a $20 credit for an interruption of service."

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VERBAL ▶ SENTENCE CORRECTION

Helping Verbs: "Might/May"

"Might" is the past tense of "may".

CORRECT: "She may arrive this evening."

CORRECT: "She might have arrived yesterday evening."

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VERBAL ▶ SENTENCE CORRECTION

"Number"

"A number of" always takes plural verbs.

CORRECT: "A number of birds have migrated…"

"The number of" always takes singular verbs.

CORRECT: "The number of warblers has increased…"

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VERBAL ▶ **SENTENCE CORRECTION**

"Having"

"Having [PAST PARTICIPLE]" is used to express actions that are finished and to convey order of occurrence.

CORRECT: "Having eaten a huge Thanksgiving dinner, Elliot loosened his belt one more notch."

VERBAL ▶ **SENTENCE CORRECTION**

Plural/Singular

"[QUANTIFIER] of [NOUN] [VERB]"

The noun determines whether verb is singular or plural.

CORRECT: "Most of the students are…"

CORRECT: "Most of the school is…"

VERBAL ▶ **SENTENCE CORRECTION**

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VERBAL ▶ CRITICAL REASONING

Scope

Stay within the scope of the argument.

- If your rationale seems farfetched, or you bring in outside knowledge to solve a question, most likely you are overreaching.
- The harder you have to work to justify an answer choice, the less likely it is that the choice is correct.

VERBAL ▶ CRITICAL REASONING

Find the Conclusion

The conclusion is often found in the first or last sentence of the passage.

- Look for conclusion signposts: "therefore, hence, thus", etc.

Premise clauses usually show support or offer evidence.

- Examples of premise signposts: "because, since, in view of, given that", etc.

VERBAL ▶ CRITICAL REASONING

Supply Your Own Conclusion

In "supply your own conclusion" questions, the conclusion must be supported by ALL premises—not just one.

Be on the lookout for helpful keywords in the second and last sentence.

VERBAL ▶ CRITICAL REASONING

Causal Assumption

Ask whether there might be an alternative cause if an argument does not necessarily seem as straightforward as a question stem makes it out to be.

"Could Y have caused Z instead of X?"

VERBAL ▶ **CRITICAL REASONING**

Assumptions -1

An assumption is merely an unstated (implied) premise.

In logically correct arguments which contain an assumption, the premise + assumption = conclusion.

If the question stem asks you "what is assumed…" then you should identify unstated premise of passage. Look for a gap in logic.

VERBAL ▶ **CRITICAL REASONING**

Assumptions - 2

Ask yourself, "What must be true to make the conclusion valid?" (using the premise + assumption = equation formula).

- Remember, since the assumption is an UNSTATED premise, any answer choice that comes from the passage to support your assumption is necessarily incorrect. The answer will be implied, not explicitly stated.

VERBAL ▶ **CRITICAL REASONING**

Strengthen the Argument

Find the logical gap and fix it with additional information. This is the ONLY type of GMAT question where additional information (outside of the question) can/should be used.

- Correct answers to this question type will:
- Connect evidence with conclusion better.
- Make conclusion stronger.
- Strengthen the evidence with new information (perhaps an assumption is needed to make the argument work).

VERBAL ▶ **CRITICAL REASONING**

Numbers, Percentages

Watch for the distinction between NUMBERS and PERCENTAGES.

VERBAL ▶ CRITICAL REASONING

Inference

Inference questions are usually very basic, about one or more premises. PICK THE OBVIOUS ANSWER (even if it seems too obvious).

VERBAL ▶ CRITICAL REASONING

Resolve the Paradox

To solve this type of question, look for a logically contradictory discrepancy.

- Often the correct answer will take a similar format (in terms of answer length or argument structure).

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Mimic the Reasoning

Follow same line of reasoning from the passage in the answer.

Eliminate the question stem detail to create a shorthand version of the argument structure.

- Question Stem: If it rains, then I will stay at home today."
- Shorthand: If A, then B."
- Answer: "If A, then B."

VERBAL ▶ CRITICAL REASONING

Strategy

Always read the question first, then read the stimulus appropriately for that type of question.

VERBAL ▶ CRITICAL REASONING

Analogy Assumptions

Are the two situations analogous? Or is the analogy silly?

VERBAL ▶ CRITICAL REASONING

Strengthen/Weaken

Strengthen/Weaken questions are the most common Critical Reasoning (CR) question type on the GMAT.

- Break down piece of evidence.
- Attack validity of an assumption.
- Don't try to prove or disprove conclusion.
- Tip the scales.

VERBAL ▶ CRITICAL REASONING

Statistical Assumptions

Are the statistics representative?

Is the question stem doing a bait and switch in terms of numbers?

Is the question stem using numbers to assume something is so, when the numbers aren't actually helping explain the phenomenon given?

VERBAL ▶ CRITICAL REASONING

Number of
Critical Reasoning (CR) Questions

Most people see 11 CR questions on the GMAT.

VERBAL ▶ CRITICAL REASONING

7 Principles of CR, 1 of 2

1. Understand structure of argument. Identify premise (P), conclusion (C) and any unstated assumptions . Look for structural signpost words which mark P and C.

2. Preview question before reading passage.

3. Paraphrase passage's point or main idea using one verb "i.e., explain, criticize, compare, contrast".

VERBAL ▶ CRITICAL REASONING

7 Principles of CR, 2 of 2

4. Judge argument's persuasiveness while reading actively.

5. Answer question being asked.

6. Prephrase answer.

7. Keep SCOPE in mind. Moderate rather than strong words / qualifiers usually correct.

VERBAL ▶ CRITICAL REASONING

Assumption

An assumption bridges the gap between argument's stated premises and conclusion.

- Use denial test.
- Compare premise words against conclusion.

VERBAL ▶ CRITICAL REASONING

Paraphrasing and Prephrasing

Paraphrasing

- Actively translate passages into your own words.
- Pretend you are explaining the information in a passage to a 10-year-old kid.

Prephrasing

- Think about what form the correct answer will take.
- As you do more questions, you will begin to "guess" correctly, as you start to think as the testmakers do.

VERBAL ▶ CRITICAL REASONING

Strengthen/Weaken

Don't be careless! Wrong answer choices often have exactly opposite of desired effect.

- Double-check that your answer satisfies the question stem, not the opposite of the question stem.

VERBAL ▶ CRITICAL REASONING

Strategy

Identify the conclusion and find the answer that addresses the conclusion. Most questions follow this guideline.

VERBAL ▶ CRITICAL REASONING

Inference

Consider the evidence, draw a conclusion.

An inference is an extension of an argument, not a necessary part of it.

A valid inference is a conclusion, but not necessarily the conclusion, of a set of statements.

VERBAL ▶ CRITICAL REASONING

4-Step Method

1. Preview question stem.
2. Read stimulus and paraphrase if tricky.
3. Prephrase answer.
4. Choose an answer which answers question stem.

VERBAL ▶ CRITICAL REASONING

Weaken/Strengthen

When you compare two items, you must be sure that the two items are indeed comparable.

VERBAL ▶ CRITICAL REASONING

Inference

For inference questions, determine which answer choice must absolutely, positively be true based on what you've read.

- Pick the obvious answer choice.
- Avoid extreme answers (too strong or too weak)

VERBAL ▶ CRITICAL REASONING

Assumption

For assumption questions, find the conclusion and determine which answer choice needs to be true for a conclusion to be valid.

VERBAL ▶ CRITICAL REASONING

Indicate Flaw

Use the information that is present in the passage to answer "Indicate the Flaw" CR questions.

Not about new information like "Weaken" CR questions.

VERBAL ▶ CRITICAL REASONING

Irrelevant

Watch for irrelevant or overly strong answer choices in CR. Stay within SCOPE and TONE of passage.

VERBAL ▶ CRITICAL REASONING

Negate

For assumption questions, negate CR answer choice to see if the conclusion can survive.

VERBAL ▶ CRITICAL REASONING

Statistics

When an argument is based on statistics, it is usually assumed that the people polled are representative of the whole.

VERBAL ▶ CRITICAL REASONING

Questions Involving Surveys

Consider: Does the survey accurately represent the views of the whole group surveyed? Is there a statistics bait and switch?

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Prephrase

Prephrase an answer before looking at the actual answer choices.

VERBAL ▶ CRITICAL REASONING

Explanation

With explanation questions, reconcile the facts presented.

- Stay within scope.

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Inference vs. Assumption

An inference is a conclusion that can be drawn based on one or more of the statements in the stimulus. An inference must be true based on something that you read.

An assumption is a missing but necessary piece of evidence. An assumption is something that must be true in order for the argument to be complete.

VERBAL ▶ CRITICAL REASONING

Scope Shifts

Be wary of scope shifts. Look for testmakers' tricks:

- Sometimes a passage will begin with one group and draw a conclusion about another group. Similarly, a passage might have weak premises and then draw an overbroad conclusion.
- Other times the tone of the passage moves so far that the testtaker is left wondering, "How did that conclusion come about?"

VERBAL ▶ CRITICAL REASONING

Evaluate the Argument

Test relevance.

Determine which a choice helps to determine whether a conclusion is valid.

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Weaken

2 most common ways to weaken an argument:

- Break down central assumption.
- Assert alternative possibilities relevant to the argument.

For additional notes

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For additional notes

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VERBAL ▶ READING COMPREHENSION

Analyzing Reading Comprehension (RC) Passage

WHY is the author writing?

WHAT is being said?

WHO is speaking? Is the author showing his own point of view or critiquing an expert's point of view?

HOW does the author accomplish his goal?

VERBAL ▶ READING COMPREHENSION

Two Types of Questions

Global (pertains to entire passage):

- Main idea, structure

Local (pertains to a small segment of passage):

- Specific

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Signposts

Watch for transition triggers. Transition triggers change the tone or direction of a passage. They often represent a shift in view between two experts cited in a passage.

Examples of transition triggers include "however, but, although", etc.

VERBAL ▶ READING COMPREHENSION

Yin-Yang Shift

A very common RC structure is for one expert or view to be introduced, and then, shortly thereafter, a contradictory expert or view is presented.

Look for this yin-yang shift.

- Yin words: "Generally, the old view, the widespread belief, most X believe", etc.
- Ying words: "However, but, on the other hand", etc.

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Inference

GMAT inferences go only a tiny bit further than what is said in the passage.

When choosing answers, eliminate exaggerations or offensive or extreme words.

VERBAL ▶ READING COMPREHENSION

Indisputable Answers

The answer choice that is highly specific and unequivocal is usually wrong.

- VAGUE, BROAD or GENERAL answers are often best.
- Look for signpost words like "perhaps" and "may" in answer choices.

VERBAL ▶ READING COMPREHENSION

Indisputable Words

Nice vague words:
- "usually, sometimes, may, can, some, most"

Too unequivocal—BAD!
- "always, most, everybody, all, complete, never"

VERBAL ▶ READING COMPREHENSION

Respect

GMAC is always respectful of professionals and America.

Avoid disparaging answers.

Respectful answers about minorities always.

No prejudiced answers.

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Strong emotions

Avoid strong emotions.

- Avoid words like: "scornful, envious, overly enthusiastic, resolve", etc.

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Strategy

Be mindful of:

- Topic
- Scope—narrowing of topic
- Author's purpose
- Structure
- Author's voice—fact from opinion

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Strategy

Make mental roadmap of passage.

Get a sense of the paragraph and argument structure.

On your scratch paper, jot down notes such as:

- Para 1: Old view
- Para 2: New theory
- Para 3: Why combo of Old view and New theory is likely best.

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Main Idea

Thesis: personal interpretation bolstered by evidence.

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Global Questions

Stay within topic and scope.

Recognize author's overall intentions, idea, passage structure, purpose.

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Scope

Scope involves the overall reach and feel of the entire passage.

Nouns and verbs contained in the correct answer must be consistent with tone/scope. If they are too weak/strong, they are probably wrong and should be eliminated.

VERBAL ▶ READING COMPREHENSION

Inference

Two types of inferences:

- Regular inference. EXPLAIN? HELP?
- Agreement: "Author/Character/Group would agree with…"

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Logic and Active Reading

As you read, think about why the author / test makers do something in the manner that they have:

- Cite a source
- Bring up detail
- Introduce a defined term or vocabulary word
- Structures the passages in a certain way

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Explicit Detail

For explicit detail questions, the answer can be pinpointed in the text.

- Save time by noting where defined terms, vocabulary words or dates are first introduced. Detail questions will likely focus on such things.

VERBAL ▶ READING COMPREHENSION

Strategy

1. Read actively and don't skim.
2. Create a mental roadmap: label paragraphs, look for signpost words.
3. Note main idea, structure, tone
4. Attack questions.

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Scope

Scope is the aspect of the topic (subject matter) that the author discusses in the passage.

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Focus

Focus on your reading on the broad idea of the passage, not every specific fact.

That said, note where overly-specific facts are first introduced, so you can zero in on them if there is a detail question later.

VERBAL ▶ READING COMPREHENSION

Inference

Inferences are suggested by passage. Remind yourself whether the inferences given as answer choices are positive, negative or neutral.

Incorrect inferences:

- Distort
- Are superfluous, contradictory, outside of scope

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Anticipate

Anticipate what's next by looking for signpost words.

- Is the author about to change course? Agree with an expert? Disagree with the view expounded in the previous passages? Cement an idea just presented?

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Qualify

To qualify a claim is to weaken or soften it.

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Signpost Words: Supporting, Continuing Points

Additional point signposts:

- "furthermore, in addition, also, too"

Additional example signposts:

- "similarly, likewise, for example"

Structural signposts:

- "first, second, third"

Conclusion signposts:

- "thus, therefore, in conclusion"

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Direction Change Signposts

Examples:
- "although, though, even though"
- "but
- "despite, in spite of"
- "except"
- "however, nevertheless"
- "unless"
- "while"

VERBAL ▶ READING COMPREHENSION

Strategy

A strategy for RC:
- Read for author's purpose and main idea.
- Note where specific examples pop up, but don't spend too much time fully understanding specifics.
- Paraphrase the structure, tone of the passage.
- Don't over-invest time.
- Spend max of 4 min. on reading, 1 min. per question.

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Main Idea

Always be searching for the main idea of a passage as you read.

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General Questions

Decoy answers for global RC questions are:
- Too specific
- Too broad
- Too extreme
- Not relevant

Specific Questions

Decoy answers for local RC questions:

- Refer to wrong part of passage
- Make sense but are not mentioned in passage
- Are refuted directly in the passage
- Stray away from passage's scope
- Misinterpret the main point of the author in that section

Strengthen/Weaken

Decoy answers for strengthen/weaken questions:

- Out of scope
- Weaken instead of strengthen, vice versa
- Logical answer but not mentioned or supported in passage (bring in outside info when there's a correct answer among the choices already)

How to Spot a Good Answer

A correct answer choice:

- Paraphrases text in terms of language style or meaning
- Is nice (not overly-controversial)
- Is not extreme (stays within scope, author intent). Does not overly pinpoint.

Good Words for RC Answer Choices

Examples:

- "some, many"
- "often, sometimes, rarely, usually"
- "can, could, may, might"
- "some people, few people"
- "more, less"
- "likely, possibly"
- "doubtful, unlikely"

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Words to Avoid in RC Answer Choices

Examples:

- "all"
- "always"
- "never"
- "will"
- "everyone, everybody"

- "no one, nobody"
- "most, least"
- "absolutely"
- "impossible"

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Topic and Scope

Always be mindful of TOPIC and SCOPE: Topic and scope can often be determined in the first paragraph of a passage. As soon as you find them, list them on your scratch paper.

Topic: General subject
Examples:

- "black holes"
- "factory safety"

Scope: Narrowing of topic
Examples:

- "logistics of viewing formation of black holes"
- "analysis of industrial rules across different historical eras"

The conclusion paragraph will also reveal the scope if it is not immediately obvious in the first paragraph.

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Specific Details

Note the location and purpose of intricate details, theories or vocabulary words, but do not attempt to memorize or even fully understand those details unless a question specifically asks about them.

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Purpose, Main Idea

Be mindful of author's PURPOSE and MAIN IDEA.

NOTE that the overall purpose and main idea can differ from the views of a specific expert in a passage.

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QUANTITATIVE ▶ GENERAL

Steps to Solve

In general …

- Medium questions require 2 steps to solve.
- Difficult questions require at least 3 steps.
- The GMAT begins with a medium question.

QUANTITATIVE ▶ GENERAL

Backsolving Strategy

Start with Choice 'E' and work back to 'A' when backsolving from the answer choices.

QUANTITATIVE ▶ GENERAL

Assuming

All numbers on the GMAT belong to the set of real numbers.

- Unless you're explicitly told that a specific type of number is involved, do not make any further assumptions.
- For example, do NOT assume that variables represent positive integers.

QUANTITATIVE ▶ GENERAL

Multiple

Multiples of 3: 3, 6, 9…

How to Check Whether Number is Multiple of 3

Sum of digits is multiple of 3.

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QUANTITATIVE ▶ GENERAL

How to Check Whether Number is Multiple of 4

Last two digits are multiple of 4.

The number can be divided by 2 twice.

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How to Check Whether Number is Multiple of 6

Number is multiple of 3 and 2.

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How to Check Whether Number is Multiple of 9

Sum of digits is multiple of 9.

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QUANTITATIVE ▶ GENERAL

How to Check Whether Number is Multiple of 12

Sum of digits is multiple of 3, last two digits multiple of 4.

QUANTITATIVE ▶ GENERAL

Common Factor

Break down both numbers to their prime factors to see what factors they have in common. Multiply shared prime factors to find all common factors.

CORRECT: What factors greater than 1 do 135 and 225 have in common?

135 = 3 x 3 x 3 x 5   225 = 3 x 3 x 5 x 5

Both share 3 x 3 x 5 in common—find all combinations of these numbers:

3 x 3 = 9;   3 x 5 = 15;   3 x 3 x 5 = 45

QUANTITATIVE ▶ GENERAL

Simple Probability

$$\frac{(\# \text{ of favorable outcomes})}{(\# \text{ of possible outcomes})}$$

QUANTITATIVE ▶ GENERAL

Gross Profit

Gross profit = Selling Price – Cost

Combined Events

For events E and F:

- not E = P(not E) = 1 – P(E)
- E or F = P(E or F) = P(E) + P(F) – P(E and F)
- E and F = P(E and F) = P(E)P(F)

Dependent Events

Two events are said to be dependent events if the outcome of one event affects the outcome of the other event.

Multiplication Principle

If a first object may be chosen in *m* ways and a second object may be chosen in *n* ways, then there are *mn* ways of choosing both objects.

Multiplication Principle

The number of ways independent events can occur together can be determined by multiplying together the number of possible outcomes for each event.

1st Rule of Probability

<u>Basic rule</u>: The probability of event A occurring is the number of outcomes that result in A divided by the total number of possible outcomes.

2nd Rule of Probability

<u>Complementary Events</u>: The probability of an event occurring plus the probability of the event not occurring = 1.

$P(E) = 1 - P(\text{not } E)$

3rd Rule of Probability

<u>Conditional Probability</u>: The probability of event A AND event B occurring is the probability of event A times the probability of event B, given that A has already occurred.

$P(A \text{ and } B) = P(A) \times P(B|A)$

4th Rule of Probability

The probability of event A OR event B occurring is the probability of event A occurring plus the probability of event B occurring minus the probability of both events occurring.

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

QUANTITATIVE ▶ GENERAL

Probability of Multiple Events

Rules:

- A and B < A or B
- A or B > Individual probabilities of A, B
- P(A and B) = P(A) x P(B) ← "fewer options"
- P(A or B) = P(A) + P(B) ← "more options"

QUANTITATIVE ▶ GENERAL

Indistinguishable Events

To find the number of distinct permutations of a set of items with indistinguishable ("repeat") items, divide the factorial of the items in the set by the product of the factorials of the number of indistinguishable elements.

Example: How many ways can the letters in TRUST be arranged?

CORRECT: $\dfrac{5!}{2!} = 60$

QUANTITATIVE ▶ GENERAL

Combinations: Order doesn't matter

$$_nC_r = \frac{n!}{r!\,(n-r)!}$$

n = number of items
r = number of items chosen

QUANTITATIVE ▶ GENERAL

Permutations: Order matters

Number of permutations of r objects from a set of n objects:

$$_nP_r = \frac{n!}{(n-r)!}$$

QUANTITATIVE ▶ GENERAL

Circular Permutations

The number of ways to arrange *n* distinct objects along a fixed circle is: (n – 1)!

QUANTITATIVE ▶ GENERAL

Probability and Geometry

If a point is chosen at random within a space with an area, volume, or length of Y and a space with a respective area, volume, or length of X lies within Y, the probability of choosing a random point within Y is the area, volume, or length of X divided by the area, volume, or length of Y.

QUANTITATIVE ▶ GENERAL

Multiple Event Probability

To determine multiple-event probability where each individual event must occur in a certain way:

- Figure out the probability for each individual event.
- Multiply the individual probabilities together.

QUANTITATIVE ▶ GENERAL

Trial Problems

Look at the probability of NOT OCCURRING.

P(Event Not Occurring) = 1 – P(Event Occurring)

QUANTITATIVE ▶ GENERAL

Slope

$y = mx + b$

$m = \text{slope} = \dfrac{\text{(difference in y coordinates)}}{\text{(difference in x coordinates)}}$

QUANTITATIVE ▶ GENERAL

Triangles

30-60-90

45-45-90

3-4-5

5-12-13

9-12-15
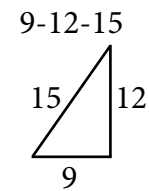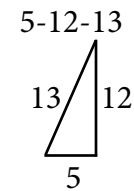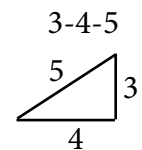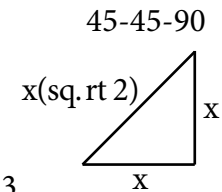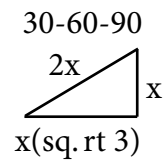
QUANTITATIVE ▶ GENERAL

Number Added or Deleted

Use mean to find number that was added or deleted.

- Total = mean x (number of terms)
- Number deleted = (original total) – (new total)
- Number added = (new total) – (original total)

QUANTITATIVE ▶ GENERAL

Odd Factors

Odd numbers have only odd factors.

QUANTITATIVE ▶ GENERAL

Purchase Price vs. Market Value

Remember: purchase price is not the same as market value.

Purchase Price = price purchased for by wholesaler
Market Value = price sold for by retailer (after markup)

QUANTITATIVE ▶ GENERAL

Quadratic Formula

To find roots of quadratic equation:

$$ax^2 + bx + c = 0$$

$$x = \frac{[-b \pm \sqrt{b^2 - 4ac}]}{2a}$$

QUANTITATIVE ▶ GENERAL

Exponents

$$x^r y^r = (xy)^r$$
$$3^3 4^3 = 12^3 = 1728$$

QUANTITATIVE ▶ GENERAL

Prime Factorization:
Greatest Common Factor (GCF)

1. Start by writing each number as product of its prime factors.

2. Write so that each new prime factor begins in same place.

3. Greatest Common Factor (GCF) is found by multiplying all factors appearing on BOTH lists.

```
60 =    2 x 2     x 3     x 5
72 =    2 x 2 x 2 x 3 x 3
HCF = 2 x 2     x 3          = 12
```

QUANTITATIVE ▶ GENERAL

Prime Factorization: Lowest Common Multiple (LCM)

1. Start by writing each number as product of its prime factors.
2. Write so that each new prime factor begins in same place.
3. Lowest common multiple found by multiplying all factors in EITHER list.

   60 =   2 x 2   x 3   x 5
   72 =   2 x 2 x 2 x 3 x 3
   LCM = 2 x 2 x 2 x 3 x 3 x 5 = 360

QUANTITATIVE ▶ GENERAL

Check for Prime

1. Pick a number n.
2. Start with the least prime number, 2. See if 2 is a factor of your number. If it is, your number is not prime.
3. If 2 is not a factor, check to see if the next prime, 3, is a factor. If it is, your number is not prime.
4. Keep trying the next prime number until you reach one that is a factor (in which case n is not prime), or you reach a prime number that is equal to or greater than the square root of n.
5. If you have not found a number less than or equal to the square root of n, you can be sure that your number is prime.

QUANTITATIVE ▶ GENERAL

Rate × Time = Distance (rt = d)

For a fixed distance, the average speed is inversely related to the amount of time required to make the trip.

CORRECT: Since Mieko's average speed was 3/4 of Chan's, her time was 4/3 as long.

rt = d

CORRECT: $\left(\dfrac{3}{4}\right) r \left(\dfrac{4}{3}\right) t = d$

QUANTITATIVE ▶ GENERAL

Factoring Exponents Example

$$5^k - 5^{k-1}$$

$$5^k - \frac{1}{5} 5^k$$

$$\left(1 - \frac{1}{5}\right) 5^k$$

$$\left(\frac{4}{5}\right) 5^k$$

QUANTITATIVE ▶ GENERAL

Squaring Fractions

When positive fractions between 0 and 1 are squared, they get smaller.

$$\left(\frac{1}{4}\right)^2 = \left(\frac{1}{16}\right)$$
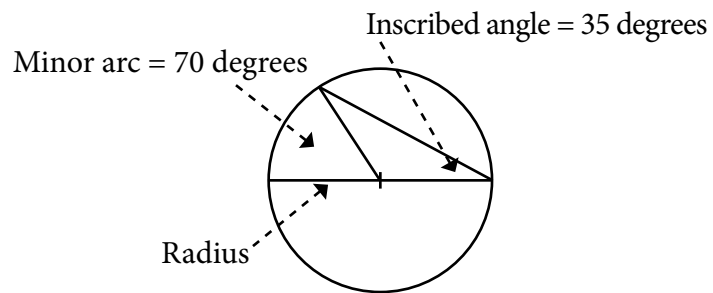
QUANTITATIVE ▶ GENERAL

Approximations

Square root of 2 = 1.4

Square root of 3 = 1.7

QUANTITATIVE ▶ GENERAL

Inscribed Angle, Minor Arc

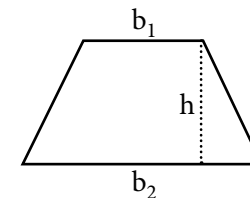Inscribed angle = 35 degrees

Minor arc = 70 degrees

Radius

Minor arc = 2 x (inscribed angle)

QUANTITATIVE ▶ GENERAL

Area of a Trapezoid

$$\frac{\text{(sum of bases)(height)}}{2}$$

b_1

h

b_2

QUANTITATIVE ▸ GENERAL

Interest Problem

<u>Example</u>: If $10,000 is invested at 10% annual interest, compounded semi-annually, what is the balance after 1 year?

CORRECT: $10,000 + (10,000)(0.05) = 10,500$

OR ⟶ $10,500 + (10,500)(0.05) = \$11,025$

CORRECT: $10,000\left(1 + \dfrac{0.10}{2}\right)^2 = \$11,025$

For Compound Interest: Divide interest by # of times compounded in 1 year to find interest for the compound period.

QUANTITATIVE ▸ GENERAL

Set Problem

Each of 25 people is enrolled in history, math, or both. If 20 are enrolled in history and 18 are enrolled in math, how many are enrolled in both?

History   Math
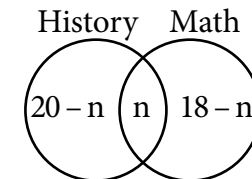
$20 - n$ n $18 - n$

CORRECT: $(20 - n) + n + (18 - n) = 25 \Rightarrow n = 13$

QUANTITATIVE ▸ GENERAL

Evenly Divisible Problem

To determine the number of integers less than 5000 that are evenly divisible by 15:

CORRECT: Divide 4999 by 15 => 333 integers

QUANTITATIVE ▸ GENERAL

Mixture Problem

<u>Example</u>: How many liters of a solution that is 15% salt must be added to 5 liters of a solution that is 8% salt so that the resulting mixture is 10% salt?

CORRECT: $0.15n + 0.08(5) = 0.1(n + 5)$

$15n + 40 = 10n + 50$

$5n = 10 \Rightarrow n = 2$ liters

Rules of Exponents

$$x^{\frac{r}{s}} = (x^{\frac{1}{s}})^r = \sqrt[s]{x^r}$$

Prime Number

A prime number is a positive integer that has exactly two different positive divisors: 1 and itself.

- 1 is not prime.
- 2 is both the smallest prime and the only even prime.

Always Try to Factor!

$$x^3 - 2x^2 + x = -5(x - 1)^2$$
$$x(x^2 - 2x + 1) = -5(x - 1)^2$$
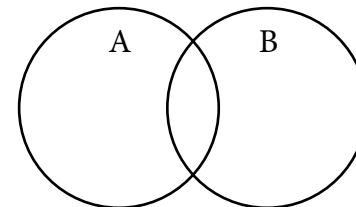$$x(x - 1)^2 + 5(x - 1)^2 = 0$$
$$(x + 5)(x - 1)^2 = 0$$
$$x = -5, 1$$

Intersecting Sets

$$|A \text{ union } B| = |A| + |B| - |A \text{ intersect } B|$$

Standard Deviation of *n* Numbers

Standard deviation measures the "spread" of the data points vs the mean. Higher SD = Higher Variation

1. Find arithmetic mean.

2. Find differences between mean and each of the *n* numbers.

3. Square each of the differences.

4. Find average of squared differences.

5. Take non-negative square root of this average.

Consecutive Integers

Even: 2n, 2n + 2, 2n + 4

Odd: 2n + 1, 2n + 3, 2n + 5

Properties of 0

Zero is an even integer.

Zero is neither positive nor negative.

Zero is a multiple of every number.

Zero is a factor of no number.

Use FOIL Method with Quadratics with Roots

$$n - 4\sqrt{n} + 4 \Rightarrow \left(\sqrt{n} - 2\right)\left(\sqrt{n} - 2\right)$$

$$\downarrow$$

$$x^2 - 4x + 4$$

Percent Increase vs. Percent of

Be careful about percent <u>increase</u> vs. percent <u>of</u>.

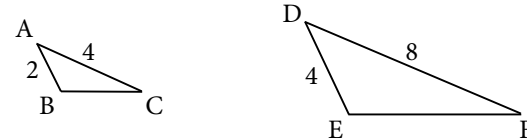% increase = (amount of change) / (original amount)
% of = portion / whole

Geometry: Similar Triangle Areas

The ratio of the areas of two similar triangles is the square of the ratio of corresponding lengths.

Each side of triangle DEF is 2 times the length of corresponding triangle ABC

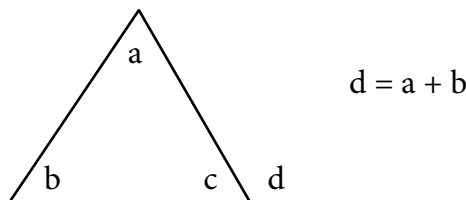Triangle DEF must have 2^2, or 4, times the area of triangle ABC.

Geometry: Triangles

Exterior angle *d* is equal to the sum of the two remote interior angles *a* and *b*.

$d = a + b$

Gross vs. Net

<u>Gross</u> is the total amount before any deductions are made.

<u>Net</u> is the amount after deductions are made.

Useful Percentages to Know

⅛ = 12.5%

⅙ = 16.6%

⅚ = 83.3%

Averages

Think of averages as balancing.

Example: The average of 3, 4, 5, and x is 5. What is x?

3 is 2 less than 5

4 is 1 less than 5

5 is the average.

x = 5 + 3 = 8

Odd and Even

Odd + Odd = Even   Odd × Odd = Odd

Even + Even = Even   Even × Even = Even

Odd + Even = Odd   Odd × Even = Even

↑

Any multiplication involving an even number creates an even product.

Simplify Base

Always try to simplify the base.

- If $27^n = 9^4$
- then $(3^3)^n = (3^2)^4 => n = \dfrac{8}{3}$

QUANTITATIVE ▶ GENERAL

Powers and Roots

To multiply one radical by another, multiply or divide the numbers outside the radical signs, then the numbers inside the radical signs.

CORRECT:
$$\frac{12\sqrt{15}}{2\sqrt{5}} = \left(\frac{12}{2}\right)\frac{\sqrt{15}}{\sqrt{5}} = 6\sqrt{3}$$
$$\left(6\sqrt{3}\right)2\sqrt{5} = \left(6 \times 2\right)\left(\sqrt{3}\sqrt{5}\right) = 12\sqrt{15}$$

QUANTITATIVE ▶ GENERAL

Percentage

To make a percentage, multiply by 100%:

CORRECT:
$$\frac{1}{400} = \frac{1}{4}\% = 0.25\%$$

To drop a percent, divide by 100%:

CORRECT:
$$\frac{1}{2}\% \times \frac{1}{100} = \frac{1}{20,000}$$

QUANTITATIVE ▶ GENERAL

Divisors

You can find all the divisors of a number by finding all the prime factors.

QUANTITATIVE ▶ GENERAL

Group Problems Involving "Either/Or"

Some GMAT word problems involve groups with distinct "either/or" categories (male/female, blue collar/white collar, etc.). The key is to organize the information into a grid.

	Doctors	Dentists	Total
Male	55	27	82
Female	39	9	48
Total	48	36	130

QUANTITATIVE ▶ GENERAL

Factor Out and Simplify

Immediately try factoring/simplifying when possible.

$$\text{Is } \frac{2x}{6} + \frac{24}{6} \text{ an integer?}$$

$$\Rightarrow \frac{2x + 24}{6}$$

$$\Rightarrow \frac{x}{3} + 4$$

QUANTITATIVE ▶ GENERAL

Volume of a Sphere

$$\frac{4}{3}\pi r^3$$

QUANTITATIVE ▶ GENERAL

Sum of Angles in a Regular Polygon

Sum of interior angles in a polygon with n sides $=180(n-2)$

QUANTITATIVE ▶ GENERAL

Multiple Event Probability

Two things to do:
- Find the total number of possible outcomes.
- Find the number of desired outcomes.

Write them out if necessary.

QUANTITATIVE ▶ GENERAL

Group Problems Involving "Both/Neither"

<u>Mixed group formula:</u>

$$\text{Group}_1 + \text{Group}_2 + \text{Neither} - \text{Both} = \text{Total}$$

QUANTITATIVE ▶ GENERAL

Added, Deleted

Number added: (new sum) – (original sum)

Number deleted: (original sum) – (new sum)

<u>Example</u>: The average of 5 numbers is 2. After one number is deleted, the new average is –3. What number was deleted?

CORRECT: Original sum: 5 x 2 = 10
New sum: 4 x (-3) = – 12
Number deleted = 10 – (– 12) = 22

QUANTITATIVE ▶ GENERAL

Balancing Method for Mixtures/Dilutions

$$\begin{pmatrix} \text{percent/price difference} \\ \text{between weaker solution} \\ \text{and desired solution} \end{pmatrix} \times \begin{pmatrix} \text{amount of} \\ \text{weaker solution} \end{pmatrix} =$$

$$\begin{pmatrix} \text{percent/price difference} \\ \text{between stronger solution} \\ \text{and desired solution} \end{pmatrix} \times \begin{pmatrix} \text{amount of} \\ \text{stronger solution} \end{pmatrix}$$

QUANTITATIVE ▶ GENERAL

Balancing Method for Mixtures/Dilutions Example

How many liters of a solution that is 10% alcohol by volume must be added to 2 liters of a solution that is 50% alcohol by volume to create a solution that is 15% alcohol by volume?

CORRECT: $n(15 - 10) = 2(50 - 15)$

$5x = 2(35) \Rightarrow n = 70/5 \Rightarrow 14$ liters of 10% solution must be added.

QUANTITATIVE ▶ GENERAL

Compound Interest

Usually you don't need to calculate compound interest. Try finding simple interest and looking for the answer that is a little bit larger.

QUANTITATIVE ▶ GENERAL

Average Rate

Average A per B = (Total A)/(Total B)

Average Speed = (Total Distance) / (Total Time)

QUANTITATIVE ▶ GENERAL

A Common Digits Problem

$$\begin{array}{r} BA \\ +AB \\ \hline CDC \end{array} \Rightarrow \begin{array}{r} 47 \\ +74 \\ \hline 121 \end{array} \text{ or } \begin{array}{r} 83 \\ +38 \\ \hline 121 \end{array}$$

QUANTITATIVE ▶ GENERAL

Factorial of Zero

$0! = 1$

QUANTITATIVE ▶ GENERAL

Compound Interest

(Final balance) = (principal) x (1 + (interest)/C)^[(time)(C)]

- C = the number of times compounded annually

Example: If $10,000 is invested at 8% annual interest, compounded semiannually, what is the balance after 1 year?

CORRECT: Final balance = (10,000)(1 + (0.08)/2)^[(1)(2)]

$$= 10,000 \text{ x } (1.04)^2$$

$$= \$10,816$$

QUANTITATIVE ▶ GENERAL

Count Consecutive Numbers

Number of integers from A to B inclusive = B − A + 1

Example: How many consecutive integers are there from 73 through 419, inclusive?

CORRECT: 419 − 73 + 1 = 347

QUANTITATIVE ▶ GENERAL

Simple Interest

Simple interest = (principal)(interest rate)(time)

↑ decimal   ↑ years

Example: If $12,000 is invested at 6% simple annual interest, how much interest is earned after 9 months?

CORRECT: ($12,000)(0.06)(9/12) = $540

QUANTITATIVE ▶ GENERAL

Sum of Consecutive Numbers

Sum = (average)(number of terms)

QUANTITATIVE ▶ GENERAL

Average of Consecutive Numbers

The average of a set of evenly spaced consecutive numbers is the average of the smallest and largest numbers in the set.

<u>Example:</u> What is the average of all integers from 13 to 77?

CORRECT: $(13 + 77)/2 = 90/2 = 45$

QUANTITATIVE ▶ GENERAL

Prime Numbers

1 is not a prime number.

The first eight prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19

QUANTITATIVE ▶ GENERAL

Percent

<u>Example:</u> 15 is 3/5 percent of what number?

CORRECT: 3/5 percent = 3/500
15 = (3/500) x whole
whole = 2500

QUANTITATIVE ▶ GENERAL

Factors

Factors of 18: 1, 2, 3, 6, 9, 18
Factors of 6: 1, 2, 3, 6

QUANTITATIVE ▶ GENERAL

Work Problems

Consider work done in one hour.

Inverse of the time it takes everyone working together = Sum of the inverses of the times it would take each person working individually.

Example: You have worker A and worker B doing a job:

CORRECT: $\dfrac{1}{A} + \dfrac{1}{B} = \dfrac{1}{T}$

QUANTITATIVE ▶ GENERAL

Guessing

According to some test prep sources: If you have to guess in a problem solving question, go with (D) or (E).

Especially with problems that force you to use or plug in the answer choices

QUANTITATIVE ▶ GENERAL

Simple Interest

$A = P(1 + r)^n$

A = amount accumulated

P = principal

r = annual rate of interest

n = number of years

QUANTITATIVE ▶ GENERAL

Quadratics

$$(x + y)^2 = x^2 + 2xy + y^2$$
$$(x - y)^2 = x^2 - 2xy + y^2$$
$$(x + y)(x - y) = x^2 - y^2$$

When you see an equation in factored form in a question, immediately UNFACTOR it; vice versa.

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QUANTITATIVE ▶ DATA SUFFICIENCY FLASHCARDS

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Insufficient

Half the time statements (A) and (B) are both insufficient.

Strategy

1. Focus on the question stem—thinking about the information needed to answer the question.

2. Look at each stem separately.

3. If neither statements was sufficient alone, look at both statements in combination.

4. Half of the Data Sufficiency (DS) answers on the GMAT come down to step 3.

Rephrase

A good data sufficiency strategy is to rephrase the information in a question:

$z + z < z$?

$=> z < 0$? (...or $0 < z < 1$)

Hard Questions

Skip statements that you do not understand.

Eliminate as much as possible.

QUANTITATIVE ▶ DATA SUFFICIENCY

What is Being Asked?

In Data Sufficiency questions, you are usually being asked 1 of 3 things:

1. A specific value
2. A range of numbers
3. Yes/No

QUANTITATIVE ▶ DATA SUFFICIENCY

Strategy

Immediately write out the DS problem type (value, range, yes/no) on your scratch paper before you begin a DS problem.

QUANTITATIVE ▶ DATA SUFFICIENCY

First Data Sufficiency (DS) Questions

Calculate out the first DS questions to make sure they are correct. It is important to start out the section strong.

QUANTITATIVE ▶ DATA SUFFICIENCY

Common Trap

Do NOT use the information in one statement as an assumption in the second statement.

- Statements are not necessarily related.
- View separately!

QUANTITATIVE ▶ DATA SUFFICIENCY

Hard Questions

On harder DS questions, answer choices tend to be more sufficient than they might appear.

- DON'T CHOOSE (E) if you have to guess.
- Pick between (A) or (C), if you can eliminate (B).
- Historically, (A) is slightly more common as the right answer.

QUANTITATIVE ▶ DATA SUFFICIENCY

Equations

For a system with *n* variables:

- If you have as many distinct linear equations as you have variables, you can answer ANY question about the system.
- If you are only asked to solve for part of the system, you don't necessarily need all *n* equations.
- If you are asked to solve for a relationship instead of the value of variables, you don't necessarily need all *n* equations.

QUANTITATIVE ▶ DATA SUFFICIENCY

"Yes/No"

About 1/3 of DS questions are "Yes/No" questions.

QUANTITATIVE ▶ DATA SUFFICIENCY

Looking at Both Statements Together

Only about half the time do you have to look at both statements in combination.

QUANTITATIVE ▶ DATA SUFFICIENCY

Sufficiency in "Yes/No" Questions

On "Yes/No" DS questions, if a statement answers the question conclusively in the affirmative or in the negative, then IT IS SUFFICIENT.

QUANTITATIVE ▶ DATA SUFFICIENCY

Strategy

<u>AD or BCE</u>: If you can determine that choice (A) is correct in your DS question, then you know that the ultimate answer must be either (A) or (D).

If you can determine that choice (A) is not correct in your DS question, then you know that the ultimate answer must be (B), (C), or (E).

For additional notes

For additional notes

QUANTITATIVE ▶ DATA SUFFICIENCY

Solving a System of Equations Rule

To solve a system of *n* variables, you need *n* distinct linear equations.

<u>Example</u>: What is the value of y?

      Given: x + y = 1

      => insufficient without another distinct equation

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