

CRITICAL REASONING NOTES - GMAT

- Always better to read the passage quickly but carefully, and then answer question stems.
- Topics can vary - make sure to distinguish reality from GMAT reality and prevent preconceptions from biasing the passage.

ANALYZING THE STIMULUS

- Stimuli fall into two categories: Facts versus Arguments:
 - Facts: Simply lays out facts in an order without drawing any conclusion. doesn't elicit any reaction from reader.
 - Arguments: state a clearly defined conclusion that is derived from a set of facts.
- When reading a passage, certain objectives need to be drawn upon:
 - **Objective 1: Does stimulus contain an argument or a set of facts:**
 - Premise vs Conclusion:
 - Premise gives a reason on why something should be believed. To identify it, ask yourself:
 - What reason has the author given to persuade me?
 - Why should I believe this argument?
 - Note: it could also include a simple fact or statement that eventually becomes part of a larger argument
 - Ex: The sky can be seen at night (P1). It looks to be blue (P2). Therefore, the sky-gods must be blue (C).
 - A conclusion is the point the author tries to prove by using another statement. It rests on the premise.
 - What does the author want me to believe?
 - What is the author driving at?
 - Key words include (**memorize them**):

<u>Premise Indicators</u>	<u>Conclusion Indicators</u>
because	thus
since	therefore
for	hence
for example	consequently
for the reason that	as a result
in that	so
given that	accordingly
as indicated by	clearly
due to	must be that
owing to	shows that
this can be seen from	conclude that
we know this by	follows that
	for this reason

- Premise or a conclusion may occur **in any order**. There may be multiple premises for a single conclusion.

- **Objective 2: Approach arguments differently from facts. If there is an argument, identify the conclusion. If it has facts, analyze them.**

- If stimulus contains an argument, It is essential to **identify the conclusion** before moving onto question stem.

- Premise/Conclusion form: When a conclusion indicator is followed by a premise indicator, the conclusion will eventually appear after second comma:

“Therefore, since higher debt has forced consumers to lower their savings, banks now have less money to loan.”

- Example:

“The rapid diminishment of the ecosystem of the Amazon threatens the entire planet. Consequently, we must take immediate steps to convince the Brazilian government that planned development projects need to be curtailed for the simple reason that these development projects will greatly accelerate the loss of currently protected land.”

- In this example, the beginning sentence is NOT a conclusion because it is used to form the author's final point. It is a PREMISE because it provides a reason to believe author's eventual conclusion.
- Additional Premise indicators: These could be essential to the argument, but could also be non-essential to the conclusion.

Furthermore
Moreover
Besides
In addition
What's more

- The difference between the main premise and the additional premise is that, even though BOTH are reasons to conclude a certain argument, the additional premise uses aforementioned words to drive the SAME point home. It provides additional proof for the conclusion, but using a different premise.
- Counter Premise Indicators: These are premises that go against the author's argument to assuage and acknowledge opposition.

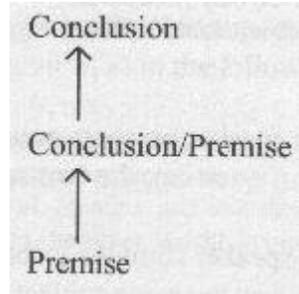
But	Although
Yet	Even though
However	Still
On the other hand	Whereas
Admittedly	In spite of
In contrast	Despite
	After all

- Trick to ID conclusion w/o indicators (Conclusion ID Method):
 - Arrange the entire statement, as to force one of the sentences to be the conclusion and the rest to be the premise.
 - Insert premise and conclusion indicators into sentences to check if they make sense.
 - Once pieces are arranged, check to see if they make logical sense. If they don't repeat first step.

- If it contains facts, examine each fact independently, holistically, and systematically.

COMPLEX ARGUMENTS:

- Simple arguments means that arguments contains ONE CONCLUSION. Complex arguments means that an argument contains MORE THAN ONE CONCLUSION.
- Complex arguments:
 - Rather than presenting a premise that informs a conclusion, a complex argument uses the **sub-conclusion** as a premise for a second conclusion.



- Be wary of wrong answer choices that mislead readers into confusing sub-conclusion from main conclusion.
 - Form 1: Usually, main conclusion is in the first sentence, and sub-conclusion is in the last sentence with a conclusion indicator preceding it.
 - Form 2: Two different speakers present two different arguments with different premise/conclusion sets.
- Opposing viewpoints:
 - In some constructions, the author may state one viewpoint, and immediately provide an opposing viewpoints. They use the following phrases:

“Some people propose...”
 “Many people believe...”
 “Some argue that...” or “Some people argue that...”
 “Some critics claim...”
 “Some critics maintain...”
 “Some scientists believe...”

- The structure of these sentences involves: **a number** (some, many, most) of **people** (students, scientists) **claim** (believe, propose). Learn to recognize it.

TRUTH VERSUS VALIDITY:

Objective # 3: If the stimulus contains an argument, determine whether the argument is strong or weak.

- It is a waste of time to evaluate each GMAT sentence for truthfulness, based on your own personal opinion.
 - It is MUCH MORE IMPORTANT to evaluate a passage for validity - the notion that one conclusion is being informed by a set of premises. We need to ask if the conclusion true, given the premise. Does it flow logically from premise.
 - Does the premise prove why the conclusion is acceptable? Are the premises well developed?
 - Are there unwarranted assumptions when constructing the argument?
- Inference versus Assumption:
 - Inference: Within an argument, an argument is the part of the argument that must be true based on the information presented in an argument.

- Assumption: Within an argument, it is an unstated premise. It is the part of the argument that must be true in order for the argument to be true.
- Even though both inferences and assumption refer to things that **MUST** be true, the difference lies in place in argument:
 - An inference is **WHAT FOLLOWS FROM** an argument (a conclusion)
 - An assumption is **WHAT IS TAKEN FOR GRANTED** when forming argument
- Note on GMAT Authors:
 - The author of the GMAT doesn't *intentionally* present flawed argument to attempt to deceive the reader. But their writings may contain flaws, which test-takers need to identify.
 - When a premise is created, the statement is likely to be accurate. They should not be looked at as a potential source of error in the argument.
 - Lastly, GMAT authors sincerely believe that their arguments are logical, sound, and well-considered.

Objective 4: Read closely and know precisely what the author said. Do not generalize!

- It is important to carefully examine every word in the text. Some words can be exploited within the wrong answer choices, since they answer may mislead the reader into believing incorrect quantities or probabilities are correct.
 - Quantity indicators: the amount or quantity in a relationship (e.g. some people, many theories, most laws, all disciplines)

Quantity Indicators
 all
 every
 most
 many
 some
 several
 few
 sole
 only
 not all
 none

- Probability indicators refer to the likelihood of occurrence or obligation (e.g. the mayor **SHOULD** resign; the voters will never vote).

Probability Indicators
 must
 will
 always
 not always
 probably
 likely
 would
 not necessarily
 could
 rarely
 never

- Argument Scope: It is the range to which the premises and conclusion encompass certain ideas.
 - For example: an argument may discuss a new surgical technique.
 - The ideas of surgery are medicine are within the scope of argument.
 - The idea of federal monetary policy are not within the scope.

- An argument may have a wide or a narrow scope. Narrow scope have definite argument and wide-scope arguments are less definite and more broad.
 - Make sure answer choices don't go beyond the scope of the argument.

THE QUESTION STEM AND ANSWER CHOICES

- Question stem includes inquiries on:
 - identifying the details within text;
 - describe the argument structure (requires premise and conclusion analysis);
 - what makes an argument stronger;
 - what makes an argument weaker;
 - identifying what the main points, inferences, or assumptions;
 - recognizing errors within line of reasoning;
 - reconciling a conflict;
 - finding arguments that are identical in structure.
- **Primary Objective # 5: When analyzing question stem, carefully read and identify the question stem (try and think, in simple terms, what it's asking us to do). Do not assume that certain words are automatically associated with certain questions types.**
 - **Note:** If the stem is referring to a certain part of the stimulus, make sure to reference that part.
- Question Group 1 (Prove): (1) Accept stimulus to be true (even if it has error in reasoning) and use it to prove that one of the answer choices must be true; (2) any items within the answer choices that are not directly in the stimulus are most likely incorrect.
 - **Must be True:** Usually occurs when argument lacks a conclusion. identify the answer that is **best supported by the stimulus**
 - *if the statement is true, what must also be true?*
 - **Main Point:** identify the **main conclusions** made by the author
 - *the point of the argument is that:*
 - **Method of reasoning:** It asks to describe, in abstract terms, the **way in which the author made his or her argument.**
 - Which one of the following describes the technique of reasoning used above?
 - **Parallel reasoning:** (an extension of method since we must understand and apply method). Used to identify the answer choice that contains **reasoning most similar in structure** to the reasoning presented in the stimulus.
 - Which argument is most similar in pattern to reasoning to the argument above?
 - **Flaw in the reasoning:** (An extension of method, except that we KNOW there is a flaw in reasoning) It asks to describe, in abstract terms, the **error in reasoning** committed by the author.
 - The reasoning in author's argument is flawed because the argument:
- Question Group 2 (**Help - usually contains "if true" in stem**): (1) The stimulus must be placed under suspicion, since there may be errors of reasoning or logic; (2) The answer choices must be accepted as factually correct and we need to determine which answer choice best meets the question posed in the stem (usually positively helping argument)
 - **Assumption:** identify what the **author assumes when making the argument**
 - *what assumption is required by the argument above?*
 - **Strengthen and support:** identify the statement that **supports, corroborates, or strengthens author's argument**
 - which of the following most strengthens authors argument?

- **Resolve the paradox:** Usually occurs when argument lacks a conclusion. In the stimulus, there could exist a paradox or a contradiction. **The questions asks about a way to resolve this conflict.**
 - Which statement most effectively resolves the apparent paradox?
- Question Group 3 (Hurt): Just like group 2, except we need to attack author's argument. (1) The information in stimulus is suspect and the reasoning errors further weaken argument (2) The answer choices must be accepted as correct and we need to determine which answer best weakens argument.
 - **Weaken:** (polar opposite of strengthen since we need to explore hole in argument that need to be opened/closed) Identify which statement **attacks or undermines author's argument.**
 - Which one of the following statements most seriously weakens authors argument?
- Question Group 4 (Evaluate): A combination of group 2 and 3.
 - Evaluate the argument: Decide which answer choice will allow you **to determine the logical validity of the argument.**
 - The answer to which one of the following questions would contribute most to an evaluation of the argument?
- Additional Note:
 - Variety: Don't expect same type of questions to appear back-to-back.
 - Most: The qualifier "most" ensures only ONE correct answer.

EXCEPT AND LEAST IN QUESTION STEMS (INTERCHANGEABLE) - usually ALL CAPS on test:

- When EXCEPT is used:
 - test taker SHOULD NOT attempt to answer the polar opposite of the questions (i.e. all statements weaken except \neq which statement strengthens)
 - instead, test-taker SHOULD find all statements that weaken argument EXCEPT for the argument that DOES NOT weaken argument.
- When LEAST is used, treat it the same way as EXCEPT:
 - if a statement is LEAST helpful in strengthening an argument, that question can be rephrased as follows: all arguments strengthen the argument EXCEPT.
 - when the term "least" is encountered, realize that FOUR statements will meet the criteria and ONE will NOT!

PREPHARSING ANSWERS

- Pre-phrasing is a strategy that involves ACTIVELY THINKING about what the correct answer would be BEFORE looking at answer stem.
- **Primary Objective # 6: After reading the question stem, take a moment to mentally formulate the answer to the question.**
 - Reading the question critically and attacking the stimulus is essential to pre-phrasing the answer.

ANSWER CHOICES

- Uniqueness Rule of Answer Choices: Every correct answer has a unique logical quality that meets the criteria in the question stem. Every answer has the OPPOSITE logical quality."
 - Logic vs Polar Opposite:
 - Polar: Wet vs Dry
 - Logic: Wet vs Not Wet (what GMAT is concerned with)

Logical Quality of the Correct Answer: Must Be True
 Logical Quality of the Four Incorrect Answers:
 the opposite of Must Be True = Not Necessarily True (could be not necessarily the case or never the case)

Logical Quality of the Correct Answer: Strengthen
 Logical Quality of the Four Incorrect Answers:
 the opposite of Strengthen = not Strengthen (could be neutral or weaken)

Logical Quality of the Correct Answer: Weaken
 Logical Quality of the Four Incorrect Answers:
 the opposite of Weaken = not Weaken (could be neutral or strengthen)

- **Primary Objective # 7: Always read all of the answer choices before answering question.**
 - Be wary of highly attractive incorrect answer choices that don't fit GMAT Logic.
- **Primary Objective #8: Separate answer choices into contenders and losers.**
 - If an answer choice immediately strikes as incorrect, eliminate immediately.
 - List answer choice as a contender if it makes sense, and IMMEDIATELY MOVE ON TO NEXT ANSWER rather than deliberating the merits of current answer.
- **Primary Objective #8: If all 5 answer choices appear incorrect, GO BACK TO STIMULUS and Re-Evaluate argument.**
 - You must have missed something key in the stimulus.

CHAPTER 1: MUST BE TRUE QUESTIONS

- These questions require us to select an answer choice that is proven by the information presented in the stimulus.
- Use the Fact Test:
 - The correct answer to a "must be true" question can always be proven by referring to the facts stated in the stimulus.
 - Do not use outside assumption to validate incorrect answer choice.
- Common indicators of question type:
 - The question stem often indicates that stimulus should be taken as true:
 - "if the statements above are true," "the statements above, if true,"
 - It asks to identify a single answer that is best supported by stimulus:
 - "which of the following must be true" "which of the following can be inferred" "most strongly support which of the following"
 - When a question asks us "what can be INFERRED," it is asking "what must be true?"
 - Examples:

“If the statements above are true, which of the following must be true?”

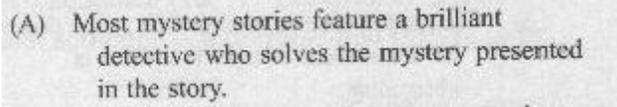
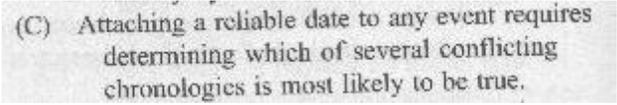
“Which of the following conclusions is best supported by the statements above?”

“The statements above, if true, best support which of the following assertions?”

“Which of the following can be correctly inferred from the statements above?”

“Which of the following is most strongly supported by the information above?”

-
- Additional Notes on "Must Be True" questions:
 - Most "Must Be True" questions are fact sets. There is no argument to discern or analyze. For this reason, they don't elicit the same type of immediate response as arguments do. Paraphrasing the answer, therefore, is more challenging.
 - It is OK to return to stimulus and re-read passage. It is NOT important to re-read entire passage every single time
 - Objective #4: We need to understand EXACTLY what the author is saying. it is important to read closely and precisely without generalizing. We are like Sherlock Holmes, looking for clues within stimulus and matching those clues to answer choices.
 - **Pay extremely close attention to MODIFIERS:**
 - Some, Many, Most, Could - wide range of scope
 - All, none, never, must, must NOT - limited scope
- Correct Answers Reviewed:
 - Paraphrased Answers: These answers restate a portion of the stimulus in a different way. If you understand the author's meaning, they are hard to miss.
 - Combination Answers: any answer yielded by combining two or more statements in the stimulus will be correct.
- Incorrect Answers Reviewed:
 - Likely to be true:
 - answers that could possibly be true (especially using real world examples) but not necessarily supported using the text are incorrect.
 - Exaggerated answers:
 - use information from the stimulus and stretch it to make a broader statement that isn't supported in the stimulus. Usually, these statements are phrased very similarly to stimulus except for an important detail (ie modifier).
 - e.g. If **some** engineers are from India, **most** engineers are NOT from india.
 - e.g. Schools are likely to adopt \neq schools will adopt.
 - "New" Information Answers:
 - Sometimes, answers introduce new information. Even though this information is logical, it isn't directly supported by the text. They *could* be correct if they fall within the umbrella of the stimulus, we should be wary.
 - If US economic policies are discussed, information on Japan's policies may not be supported.
 - Check by:

- examining the scope of the argument and ensuring it doesn't fall within scope.
- combining elements to make sure it's isn't a consequence of a combination answer.
- Shell Game:
 - A common trick is to introduce an idea in stimulus and introduce a similar idea in the answer. But the idea is changed enough to make answer wrong.
- Opposite Answer:
 - They suggest the opposite of what is mentioned in the stimulus. Trap for fast readers.
- Reverse Answers:
 - This answer reverses certain elements of the answer. For example, saying that: Some stores use many different toppings IS NOT the same as many stores use some different toppings.
- Must Be True Problem Set:
 - Q1: Be aware of modifiers (any, only, all). Consider combination answers that rephrase original answer. Read sentence carefully.
 - Q2: Watch out for answers that are beyond the scope of the passage.
 - Q3: Make distinction between BOTH type of pile driving standards and apply the definitions.
 - Q4: Watch out for modifiers.
 - Q5:
 - 
 - "most" is an exaggeration.
 - Q7: Draw a picture of a complex biological phenomenon.
 - Q8:
 - 
 - Passage doesn't describe ANY event, just ONE TYPE of event.

MAIN POINT QUESTIONS:

- Less Common in CR but very common in RC. Helps understand author's main argument.
- A subcategory of the "must be true" except for an important caveat: answer MUST capture the MAIN POINT (the author's CONCLUSION, not the premise).
- Do NOT expect main point to be the first or last sentence of the stimulus.
 - There are occasions when the main point occurs in the middle.
 - Also, there may be a sub-conclusion at the end of the sentence, which may NOT be the main point. Do not make assumptions about placement.
- Example:
 - Which choice accurately restates the main point?
 - Which accurately expresses the conclusion of the argument?
- Incorrect choices:
 - Answers that ARE true but NOT the main point.
 - Answers that repeat the premise of the argument.
- Use Conclusion ID Methods:

- Place premise/conclusion indicators before a set of sentences and check if they make sense.
- Main Point Question Type Review:

Prediction, the hallmark of natural sciences, appears to have been possible by reducing phenomena to mathematical expressions. Some social scientists also want the power to predict accurately and assume they ought to perform the same reduction. But this would be a mistake: it would neglect data that are not easily mathematical and thereby would only distort the social phenomena.

Which one of the following most accurately expresses the main conclusion of the argument?

- (A) The social sciences do not have as much predictive power as the natural sciences.
- (B) Mathematics plays a more important role in the natural sciences than it does in the social sciences.
- (C) There is a need in the social sciences to improve the ability to predict.
- (D) Phenomena in the social sciences should not be reduced to mathematical formulas.
- (E) Prediction is responsible for the success of the natural sciences.

- - The answer isn't A, even though the author would agree with it. It is broader than A. The main conclusion rejects the idea of reducing social sciences using math. So it should be D (the mistake that occurs).

WEAKEN QUESTIONS

- These questions try to decisively undermine the author's argument. They are the MSOT FREQUENT type of questions on the GMAT.
- In addition to the primary objectives, keep in mind:
 - In order to attack author's argument, it is important to ISOLATE premise and conclusion and UNDERSTAND what the author is arguing.
 - All WEAKEN questions impact the conclusion, so focus specifically on THE CONCLUSION.
 - READ ARGUMENT CAREFULLY to find holes in the reasoning or logic.
 - PREPRASING IS VERY IMPORTANT, so actively think about WHAT may weaken the argument.
 - Answer choices don't have to be mentioned within stimulus. They may include NEW INFORMATION.
- Characterizing question stem:
 - Following words are present in stem:

weaken
 attack
 undermine
 refute
 argue against
 call into question
 cast doubt
 challenge
 damage
 counter

- The stem indicates that you should accept the answer choices as true, by prefacing it with "**if true.**"
- How to Weaken the Argument:
 - We are not trying to DESTROY the argument, only hurting it.
 - **When reading answer choices, consider whether the choices would cause author to RECONSIDER or RESPOND!**
 - Strategy 1: Weaken the premise:
 - rarely happens cause it's really easy to spot an answer that directly contradicts the premise.
 - the only time this happens is when the author attacks a sub-conclusion, which affects the conclusion.
 - Strategy 2: Weaken the conclusion:
 - Failure to account for a possibility: Answer choice will show that the conclusion fails to account for some element or possibility.
 - Error of assumptions: Stimuli for these questions contain error of assumptions. Answer choices will attack assumptions made by the author.
 - Statement: If neighbours have blue cars, I have blue car. Assumption: Neighbour's car color affects my car color. Weaken: The impact of neighbour's car has not determinative effect on individual's car.
 - Focus on answer that attacks the way the author arrived at the conclusion. **FOCUS ON THE EFFECT THE ANSWER HAS ON THE CONCLUSION.**
 - Personalize the argument: How would YOU would respond when talking to the author.
- Weakening Scenarios:
 - Incomplete information: Author fails to consider all possibilities or rely on incomplete evidence. In this case, think of new possibilities or evidence.
 - Improper Comparison: The author attempts to compare items that cannot be compared.
 - Qualified Conclusion: Author qualifies/limits conclusion in a way that leaves it open to attack.
- Incorrect Answer Traps:
 - Opposite Answer: Rather than weakening, answers strengthen argument.
 - Shell Game: When an answer is raised in stimulus and raised AGAIN in argument.
 - Out of Scope Answers: Raise issues that miss the point of the argument or are irrelevant.

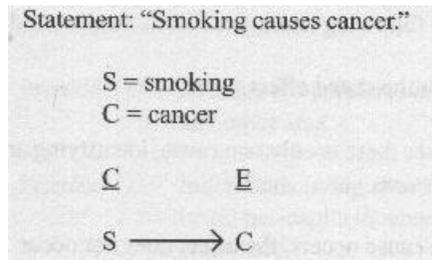
CAUSE AND EFFECT REASONING:

- Cause and effect reasoning asserts or denies that ONE THING CAUSES ANOTHER. Most causal CONCLUSIONS ARE FLAWED in reasoning because alternate explanations exist.
 - Cause is the event that makes the resulting Effect occur.
- Typical expressions implying causality (MEMORIZE):
 - The **extreme weather** is **caused by** **climate shift**.
 - **Obama's declining popularity** is **because of** his **pro-Islamic rhetoric**.
 - The **banks** should be held **responsible for** the **global economic crisis**

caused by
 because of
 responsible for
 reason for
 leads to
 induced by
 promoted by
 determined by
 produced by
 product of
 played a role in
 was a factor in
 is an effect of

-
- If a causal relationship occurs in a conclusion, the reasoning is flawed because it is claiming that one premise causes an effect:
 - INCORRECT: A lot of people in America have cancer. Milk is drunk very often by Americans. **So milk causes cancer.**
 - this is flawed because there is no evidence to suggest that milk causes cancer. the author has used two premises and established a causal relationship in the conclusion.
 - Correct: Milk has been proven to cause cancer. North Americans drink milk. North Americans have a higher chance of contracting cancer.
 - This is a correct line of reasoning because the premise establishes a causal relationship and the eventual conclusion follows logically from the causal premise.
- In general, a conclusion is erroneous if it takes two premises and establishes (within the conclusion), a causal relationship between them.
 - But if the causal relationship is established in one of the premises, and the conclusion follows logically from it, there IS NO mistake.
- Errors of Causality (Scenarios)
 - Scenario 1: One event occurs BEFORE another (post-hoc, ergo propter hoc).
 - Just before an initial premise appears before the second event, it does not imply causality.
 - e.g. The rooster crows before the sun rises. Therefore, the rooster causes the sun to rise.
 - just because one statement appears beforehand, it DOES NOT cause the other.
 - Scenario 2: Two (or multiple) events occur at the same time
 - When two events occur simultaneously, it would be a mistake to presume that an event causes the other event. Instead:
 - Both events could have occurred due to a third event
 - There could be a correlation between the two events without being a causation.
 - Example: During the early mornings, there are more accidents. Early mornings cause accidents.
 - Incorrect: third explanation - people are TIRED.'
- Causality Assumption:
 - In the real world, one effect can be caused by multiple stimuli. And one cause can have multiple effects. For example, if a car stops, it's because it runs out of gas.
 - In the GMAT world, the writer assumes that the stated cause is the ONLY possible cause of the effect and the stated cause will ALWAYS produce the effect.

- **central causal assumption:** This assumption essentially states that when a causal conclusion is formed, ALL alternatives have been taken into account and negated. Only ONE cause is valid - the one that causes the effect.
- example: temper near the equator are high. there is poverty near the equator. high temperature causes poverty.
 - So, in essence, we have negated ALL other possibilities.
 - Somewhat incorrect answer choices will suddenly become correct.
- How to attack a Causal Conclusion: Remember, the author's underlying assumption is that the stated cause is the ONLY cause that can create said effect. No other cause can create same effect. To weaken or strengthen this assumption, we can:
 - find an alternative cause for the stated effect
 - show that even the cause occurs, effect doesn't take place
 - show that even when effect occurs, cause did NOT occur
 - show that there are statistical issues in the causal conclusion.
 - Show that stated relationship is reversed or backwards.
- Diagramming Causality: Because writing out the entire causal relationship would be onerous, it's better to draw a causal diagram:



- once the representation of the causal effect has been diagrammed, it is important to stick to it.
- Causal Reasoning Review:
 - Causality occurs when one event is said to make another occur. The *cause* is the event that makes the effect occur. The *effect* is the event that follows from the cause.
 - Causal conclusions are flawed because of alternative explanations, a third event causing the effect, correlation NOT causation, or reversal of situations.
 - Causal statement location:
 - in conclusion: Reasoning is undoubtedly flawed. GMAT questions will focus on weakening the causal conclusion.
 - in premise: Reasoning MAY be flawed, but not because of the premise but because of flaw in argument
 - There are two scenarios that lead to causal conclusions:
 - (1) One event occurs before the other
 - (2) Two or more events occurs at the same time
 - Causal Assumption: The cause is the SOLE event causing the effect and will ALWAYS produce the effect.
 - In order to weaken a causal conclusion: (1) find an alternative cause for effect; (2) prove that effect does not take place (3) show that cause does not take place (4) show statistical improbability (5) show that
- Final Note

- It is very important to recognize causality and immediately diagram it. Also, find if the cause/effect is in the conclusion or the premise. Make sure to apply the causal assumption. Then see if it can be weakened.
- Questions:
 - Three:
 - Premise: violent crime are a serious problem.
 - Conclusion: Because there are more reports of violent crime, average citizen is more likely to be victim of crime.
 - this causal conclusion is flawed because it can be reversed (because citizen is more likely to be a victim, there are higher reports) and because there could be alternative explanations (more people reporting crimes)

CHAPTER 8: STRENGTHEN AND ASSUMPTION QUESTIONS

- These are two questions type from Second family type (where we assume answer choices are true and question the stimulus). Approaching each question both is similar, yet different.
- Similarities in approach:
 - isolating and understanding the argument is critical. analyze the premise and conclusion.
 - Focus on the conclusion since answer choices impact it.
 - Find errors of reasoning in stimulus, since they most likely exist.
 - Pre-phrase before looking for answer.
 - Answers bring outside info. Don't dismiss answer choice if its content doesn't exist in stimulus.
- Differences:
 - Strengthen questions: They ask you to support the argument in ANY way possible or identify answer choice that best supports the argument.
 - Assumptions questions; They ask you to identify any statement that needs to be true to validate the argument.
 - An assumption is an unstated premise of the argument.
- Strengthen Questions:
 - Key phrases include:

strengthen
support
helps
most justifies

 - "Which of the following most strongly supports /strengthens the argument"
 - "Which of the following does most to justify the conclusion?"
 - "Each of the following supports the claim, EXCEPT"
 - How to strengthen an argument:
 - Identify the argument, especially the conclusions.
 - Personalize the argument - look at it from a personal perspective.
 - Find any weaknesses in the argument to close the gap or eliminate weakness.
 - especially true for *assumption* questions.
 - Answer choices may contain analogies or surveys. Any answer that strengthens the validity of survey is correct.

- Correct answer may strengthen a little or a lot. Be wary of the variation.
- Incorrect Answers
 - Shell game: when a very similar answer choice appears in answer that has been changed enough to be incorrect. This answer may support a *slightly different* conclusion.
 - Out-of-scope Answers: They miss the point of the argument and support incorrect claims/arguments.
 - Opposite answers: weaken the argument.
- Questions:

Advertisement: At most jewelry stores, the person assessing the diamond is the person selling it so you can see why an assessor might say that a diamond is of higher quality than it really is. But because all diamonds sold at Gem World are certified in writing, you're assured of a fair price when purchasing a diamond from Gem World.

- - Personalize argument: If diamond being assessed is the differentiator, then WHO is assessing the jewellery? Independent contractor? Yes!

Statistician: A financial magazine claimed that its survey of its subscribers showed that North Americans are more concerned about their personal finances than about politics. One question was: "Which do you think about more: politics or the joy of earning money?" This question is clearly biased. Also, the readers of the magazine are a self-selecting sample. Thus, there is reason to be skeptical about the conclusion drawn in the magazine's survey.

Each of the following, if true, would strengthen the statistician's argument EXCEPT:

- (A) The credibility of the magazine has been called into question on a number of occasions.
- (B) The conclusions drawn in most magazine surveys have eventually been disproved.
- (C) Other surveys suggest that North Americans are just as concerned about politics as they are about finances.
- (D) There is reason to be skeptical about the results of surveys that are biased and unrepresentative.
- (E) Other surveys suggest that North Americans are concerned not only with politics and finances, but also with social issues.

- - The statistician is claiming that the self-selected population and biased question makes survey unreliable. Seems like a fair point. *Note that because*

this survey is brought into question, we don't have to treat it as valid. Other surveys CAN be treated as correct.

- ABCD support author's claim that survey is valid.
- E: Correct: Remember, the stimulus doesn't imply that people aren't concerned with politics. This would strengthen the statistician's claim by showing that survey is incorrect. But this statement provides NO NEW INFORMATION since we already know from premise that people are concerned with BOTH.
- Causality and Strengthen Questions: The steps taken to prove a cause-effect relationship is strong requires the OPPOSITE steps as weakening:
 - Prove that when the cause occurs, effect always takes place
 - Prove that when effect occurs, it occurs because of the cause.
 - Eliminate any other reasons that cause the effect.
 - Prove that the relationship between C->E cannot be reversed.
 - Prove that statistical improbability won't occur.
- Example (167/311):

Modern navigation systems, which are found in most of today's commercial aircraft, are made with low-power circuitry, which is more susceptible to interference than the vacuum-tube circuitry found in older planes. During landing, navigation systems receive radio signals from the airport to guide the plane to the runway. Recently, one plane with low-power circuitry veered off course during landing, its dials dimming, when a passenger turned on a laptop computer. Clearly, modern aircraft navigation systems are being put at risk by the electronic devices that passengers carry on board, such as cassette players and laptop computers.

- All answer choices show that having electronics on a plane interferes with the circuitry except ONE, which simply lays out the dates in which different technologies came into fruition.
- Example (167/311):
 -

Amphibian populations are declining in numbers worldwide. Not coincidentally, the earth's ozone layer has been continuously depleted throughout the last 50 years. Atmospheric ozone blocks UV-B, a type of ultraviolet radiation that is continuously produced by the sun, and which can damage genes. Because amphibians lack hair, hide, or feathers to shield them, they are particularly vulnerable to UV-B radiation. In addition, their gelatinous eggs lack the protection of leathery or hard shells. Thus, the primary cause of the declining amphibian population is the depletion of the ozone layer.

Each of the following, if true, would strengthen the argument EXCEPT:

- (A) Of the various types of radiation blocked by atmospheric ozone, UV-B is the only type that can damage genes.
- (B) Amphibian populations are declining far more rapidly than are the populations of nonamphibian species whose tissues and eggs have more natural protection from UV-B.
- (C) Atmospheric ozone has been significantly depleted above all the areas of the world in which amphibian populations are declining.
- (D) The natural habitat of amphibians has not become smaller over the past century.
- (E) Amphibian populations have declined continuously for the last 50 years.

- D sounds like a good answer until we realize that this choice eliminates other possible explanation for decline. Had habitat shrunk due to humans, the UVB argument would be hurt. But it didn't, so sunlight was a cause. **A is purely irrelevant because it doesn't matter which rays cause or don't cause damage to genes. In the end, it doesn't shed any new light on the decline in amphibian population because of UV radiation. Regardless of whether others are blocked that may cause damage is irrelevant.**

- **Strengthen Question Review:**

- To approach this question, first identify the conclusion, personalize the argument, and look for holes in the argument.
- Typical wrong answer choices include shell game, opposite answers, and out of scope answers.
- In order to strengthen an argument, we must eliminate alternative causes, show that action always causes effect, show that effect always results from cause, eliminate potential reversal of cause-effect relation, or show statistical likelihood.

- **Assumption Questions**

- An assumption is the critical, hidden part of an argument that **MUST** be true in order for the argument to be true. It requires delving into author's mindset and considering what he/she thought was true when formulating an argument.
- Assumption questions differ from must-be-true questions because the assumption is made **BEFORE** the argument, whereas the must be true statement follows **FROM** the argument.
- Sample questions:
 - the argument in the passage depends on which of the following assumptions?
 - the argument above assumes that:
 - the conclusion is based on which of the following assumption
 - which of the following is an assumption made in drawing the conclusion?
 - The conclusion can't be true unless which of the following is true?

- **Two Types of Assumption:**

- Supporter Assumption: A linking assumption that connects premise with conclusion.

- Usually, an argument introduces a new/rouge topic within the premise or conclusion. This element, by itself, may seem to come out of nowhere. In order for argument to be valid, there are underlying assumptions that fill the gap in the argument by connecting rouge idea to rest of argument. It eliminates the weakness in the argument. These assumptions lend themselves to pre-phrasing.
 - German cars have fantastic engineering. BMW is a well-designed car.
 - Rouge idea: BMW.
 - Supporter Assumption: BMW is a German car. BMW has the same level of engineering as other German cars.
 - Defender Assumption
 - These assumptions defend the argument by eliminating ideas that could potentially weaken the argument. In essence, there are an infinite number of ideas that could weaken the argument. But a GMAT author, in forming their airtight argument, has used defender assumptions to annul any sources of contention.
 - e.g. People who tend to be very rich have white skin. Therefore, white skin makes you richer.
 - Defender assumption would state that being rich isn't caused by education, intelligence, inheritance, etc. It is only caused by something in our skin.
- Assumption Negation Technique (*use this technique on contender choices*):
 - This technique allows us to transform an assumption question into a weakness question by making a logical opposite of it. To identify the underlying assumption within answer choice, flip the answer choice by adding or removing a NOT within the statement. The statement that weakens or attacks the question is the answer.
 - Logical opposite review: this divides the subject logically into two parts that contain all possibilities (e.g.: sweet's logical opposite is *not* sweet; NOT sour).
 - Opposite Constructs depict the inclusion or exclusion of elements in a logical manner.
 - e.g. 1:
 - All (100) - includes everything
 - *Logical Opposite: Not All - anything but 100 (0-99)*
 - e.g. 2:
 - Some: 1-100
 - Logical Opposite: None: 0
 - It is critical to note that Some can include 100 (or all).

	Quantity	Time	Place
0	None	Never	Nowhere
1-100	Some	Sometime	Somewhere
0-99	Not all	Not Always	Not everywhere
100	All	Always	Everywhere

- Remember that if something occurs a precise number of times you can negate it by saying that it either "never" occurs or that it occurs more that many times.
- Quirks in Assumption Questions:
 - if statement contains ***at least one*** or ***at least some***, chances are high that the statement is correct. Always check with Assumption Negation with the "none" as negation.

- If an answer contains statements such as ***the primary purpose, the top priority, or the main factor***; chances are high that answer is wrong since author can introduce another factor that's even more important.
- If an answer contains negative terms or statement, it is not necessarily incorrect.
- Assumptions and Causality:
 - Because the author assumes that the stated cause is the ONLY cause, correct answer choices may:
 - When the epithelial tissue is exposed to the sun, uv rays can cause genetic alterations which eventually lead to pigmentation diseases. It is a well known fact that people near the equator are always exposed to the sun. therefore, all people on the equator have pigmentation diseases.
 - **cause: exposure to sun and effect: disease.** An assumption question with causality could try to
 - eliminate alternative cause: *genetic predisposition does not cause this disease.*
 - show that when cause occurs, effect always takes place: *people in Pakistan who have most sunlight ALL have pigmentation disorder.*
 - show that when cause doesn't occur, cause never occurs: in areas with NO sunlight has NO disease
 - Eliminates reversal: The disease does not cause exposure to sun
 - Show that data is accurate: A survey shows that all people exposed have this disease.
- 3. Doctors in Britain have long suspected that patients who wear tinted eyeglasses are abnormally prone to depression and hypochondria. Psychological tests given there to hospital patients admitted for physical complaints such as heart pain and digestive distress confirmed such a relationship. Perhaps people whose relationship to the world is psychologically painful choose such glasses to reduce visual stimulation, which is perceived as irritating. At any rate, it can be concluded that when such glasses are worn, it is because the wearer has a tendency to be depressed or hypochondriacal.

 - Cause: depression; Effect: Glasses
 - Some answer choices will list the cause of depressions (not part of argument). Other choices will list the effects of the effect (effect of wearing glasses). Be aware of these intricacies.
 - Correct answer choice will simply show that the effect cannot be reversed: Basically, wearing glasses CANNOT make you depressed.
- Fill in the Blank Questions:
 - Assumption questions: Some stimulus end with a blank. The blank is usually preceded by a premise indicator. This means that the blank must contain an assumption that the author will need to make to validate answer.
 - Main point questions: Some blanks may contain a conclusion indicator, which means we must make the main point for the author. Need to select answer that summarizes main point.
- Assumption Question Review:
 - The assumption is an answer that the author relies on within argument. There are two types:
 - supporter: they link a rouge idea to rest of statement. Usually used in weak arguments with holes.
 - defender: they defend against all possible means of distorting argument.
 - Negation allows us to transform assumption qstns to weaken question by using logical opposites
 - **An assumption ANSWER CHOICE cannot simply restate the conclusion in a different way.**
 - **Also, to identify supporter assumptions, really try to find what's missing that could potentially link the conclusion and the premise!**

- *Ninja Example:*
 - In recent years, a village outside Osaka, Japan has taken to hosting a ninja festival, a celebration of Japan's heritage that reflects on its feudal past while exalting its pop culture driven present. But clearly only children take this festival seriously, for they are the only attendees who bother to dress up as ninjas. In this example, it is critical to draw the correct causality diagram. If you take this event seriously, you MUST wear the costume. But if you wear this costume, you may or may not take the event seriously. This makes B correct over A.
 - a) Any attendee who dresses up as a ninja takes the festival seriously.
 - b) No attendee who takes the festival seriously would fail to dress up as a ninja.

CHAPTER 8: RESOLVE THE PARADOX QUESTIONS:

- The stimuli presents two ideas that contradict each other. Treat answer choices as true and stimulus as suspect. The stimulus does not have
 - No conclusion: Stimuli just contains two contradictory facts and doesn't make a conclusion.
 - It contains contradictory language: Words such as *but, however, yet, although, paradoxically, and surprisingly*. This language is a cue to begin pre-phrasing
- Question Stem Features:
 - There is an indication that the answer choices should be accepted as true. It will contain: "which of the following, if true..."
 - There will be terms that indicate our task is to resolve a problem:
 - We need to: *resolve, reconcile, explain certain paradox, discrepancy, contradiction, conflict, puzzle, etc.*
 - E.g.:
 - Which of the following, if true, most helps to resolve contradiction?
 - Which of the following, if true, explains the conflict?
 - Which of the following, if true, best explains the contrast?
- Active Resolution:
 - The test maker doesn't aim to nullify one element and support the other. This would make correct answer too obvious. Instead, the correct answer will:
 - Resolve the paradox by making both sides true under given conditions;
 - **show how both sides can co-exist (If it only proves one side of the paradox, it is INCORRECT);**
 - explain how situation came into existence.
 - Try and select an answer choice that explains a possible CAUSE of the phenomenon.
 - If a stimulus contains a paradox where two items are similar, the answer cannot describe a difference. Similarly, a difference cannot explain a similarity (?).
 - Answer choice that contain low/high rates of success are common:
 - Good surgeon performs difficult surgeries. Good lawyer gets tough clients.
 - *other factors make it more difficult to be successful.*
- Addressing the Facts:
 - Incorrect answer will be appealing by stating seemingly logical inferences that DO NOT derive from the facts of stimulus. The correct answer *must conform* to the stated facts of the case.

Calories consumed in excess of those with which the body needs to be provided to maintain its weight are normally stored as fat and the body gains weight. Alcoholic beverages are laden with calories. However, those people who regularly drink two or three alcoholic beverages a day and thereby exceed the caloric intake necessary to maintain their weight do not in general gain weight.

Which one of the following, if true, most helps to resolve the apparent discrepancy?

- (A) Some people who regularly drink two or three alcoholic beverages a day avoid exceeding the caloric intake necessary to maintain their weight by decreasing caloric intake from other sources.
- (B) Excess calories consumed by people who regularly drink two or three alcoholic beverages a day tend to be dissipated as heat.
- (C) Some people who do not drink alcoholic beverages but who eat high-calorie foods do not gain weight.
- (D) Many people who regularly drink more than three alcoholic beverages a day do not gain weight.
- (E) Some people who take in fewer calories than are normally necessary to maintain their weight do not lose weight.

- **an extremely important point to remember is that the answer choices need to be treated as FACTS that cannot be nullified - even if answer doesn't seem correct!**
- Also, the correct answer must address the facts of the case. The fact is that the stimulus is discussing **people who EXCEED THEIR CALORIC INTAKE**. Answer must explain why this subset of drinkers DO NOT GAIN WEIGHT. Only B answers this question correct. It is ESSENTIAL TO GET FACTS STRAIGHT.
 - A discusses people who DON'T exceed caloric intake
 - C discusses different population
 - D restates the facts without providing explanation (question stem). Refers to incorrect population. Needs to provide explanation.
 - Refers to group of individuals that DO NOT exceed calories.