NEGATION TEST: ARTICLE #2

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HOW DO YOU NEGATE STATEMENTS?

INTRODUCTION

In order to negate any statement in CR, you should be familiar with the concept of logical negation and representing sample spaces on the Possibility Line. We cover all of this in our first article in the **Negation Test Series**: **What is Negation and What are Various Sample Spaces**. In this article, we will apply that understanding to master the negation of any given statement. Right then…Let's get started!

HOW TO NEGATE STATEMENTS

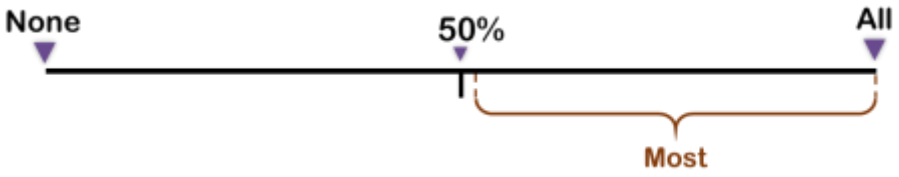
By this time, you should be somewhat comfortable with the concept of Possibility Line and representing various sample spaces on it. Let's follow a step-by-step approach to see how this understanding can help you negate statements easily.

STEP 1: UNDERSTANDING THE SEGMENT

The first step in negating a statement is understanding the **segment** the statement talks about. How do we do that? We simply understand about whom/what is the information given; for instance, if the statement says *Most basket-ball players are more than six feet tall*, then our segment is just basketball players and **not** any other kind of players - the statement gives information ONLY about basket-ball players.

STEP 2: UNDERSTANDING THE SAMPLE SPACE

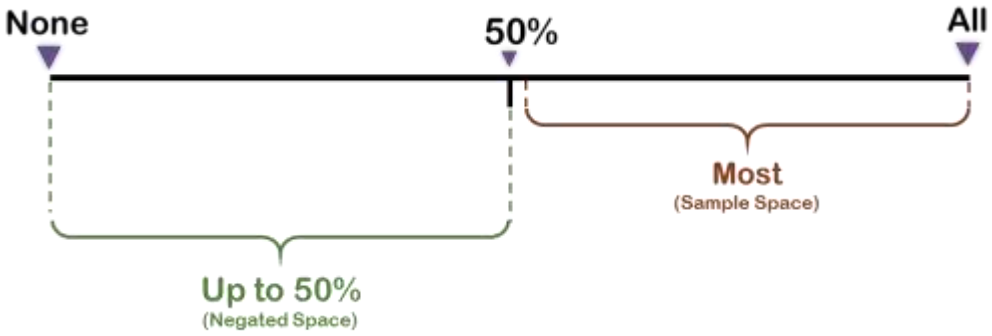
The second step in negating a statement is understanding the **sample space** the statement gives information about. Now, you know that typically group-markers such as *some, most, none* etc. determine the sample space for the statement. Accordingly, in the current example, the sample space would be the range covered by the group marker "Most" = >50%. This sample space is basically the point/range of possibilities covered by the statement on the Possibility Line. Accordingly, let's represent it on the Possibility Line:



STEP 3: UNDERSTAND THE POSSIBILITIES OUTSIDE THE IDENTIFIED SAMPLE-SPACE

This is the third and the final step in negating a statement. On the Possibility Line, determine the area that is NOT covered by the sample space/range of possibilities covered by the given statement.

So, in the current example, the area that lies outside the possibilities covered by *Most* is *Up to 50%*. This is it! This is the negated space, using which we'll create the negated statement.



*Negated space = possibilities not covered by the original sample space

So far so good. But how do you write this down in the form of the negated statement? It is very simple. To derive the negated statement, you just need to **replace the original group marker** in the original statement, "Most" in this case, **by the negated space**. Let's do this together.

Original Statement: *Most basket-ball player are more than six feet tall.*

Negated Statement: *Up to 50% of basket-ball players are more than six feet tall.*

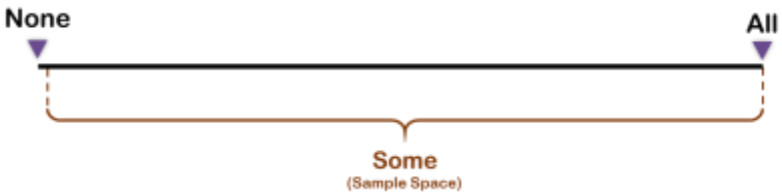
Simple, wasn't it? Let's apply the process to some more example statements.

EXAMPLE A

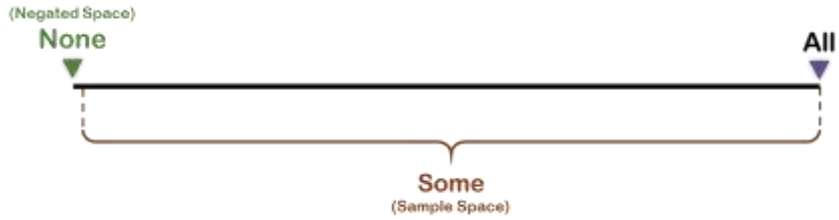
Original Statement: *Some farmers who live in India have adopted modern techniques in farming*.

Step 1 Understanding the Segment: The statement talks about a category of farmers: farmers WHO live in India. Therefore, this is our segment.

Step 2 Understanding the Sample-Space: The group marker present in the statement is some. Therefore, the range of possibilities this statement talks about is 1- 100. Let's represent it on the Possibility Line:



Step 3 Understand the possibilities OUTSIDE the sample space: As you can see in the above section, the sample space covered by *some* is 1-100. Therefore, we are left with only one possibility on the Possibility Line that is OUTSIDE this space – the possibility of *none/no* or 0 farmers who live in India. This is indeed the negated space. Let's see it on the Possibility Line:



Let's now deduce the negated statement by replacing the original group-marker by the negated space:

Original Statement: *Some farmers who live in India have adopted modern techniques in farming*.

Negated Statement: *None of the farmers who live in India have adopted modern techniques in farming.*

EXAMPLE B

Let's take another example, and this time we'll evaluate some given statements to see which one fits the bill of the negated statement.

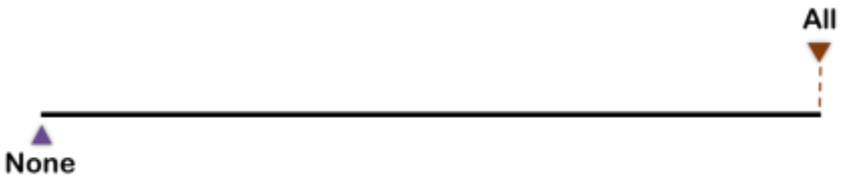
Original Statement: Every individual who has taken a loan will say that EMIs are a headache.

Options for negated statements:

A. Not every individual who hasn't taken a loan will say that EMIs are a headache.
B. Only some individuals who have taken a loan will say that EMIs are a headache.
C. No individual who has taken a loan will say that EMIs are a headache.
D. At least one individual who has taken a loan will say that EMIs are a headache.
E. Not every individual who has taken a loan will say that EMIs are a headache.

Step 1 Understanding the Segment: The statement talks about a category of individuals: individuals WHO have taken some loan or the other.

Step 2 Understanding the Sample-Space: The group marker present in the given statement is *Every*. Now *every individual* means the same as *all individuals*. Accordingly, let's represent it on the Possibility Line:



Step 3 Understand the possibilities OUTSIDE the sample space: As you can see in the above section, ***all* represents a single possibility point** where each and every individual who has taken a loan will say that EMIs are a headache. So, if this segment contains 100 such individuals, then *all* represents the point at which all 100 will say that EMIs are a headache. Accordingly, anything that is outside this possibility point falls under the negated space. Now what is this negated space? Think about it. If we start from 0, then up till what point we do not reach all or 100? It is 99, right? So the negated space will cover the range 0-99. We can represent this on the Possibility Line in the following way:

Let's now deduce the negated statement by replacing the original group-marker by the negated space:

Original Statement: *Every individual who has taken a loan will say that EMIs are a headache.*

Negated Statement: *Not all individuals who have taken a loan will say that EMIs are a headache.*

Now that we know what the negated statement is, evaluating the given options should be a cakewalk. So, let's get cracking!

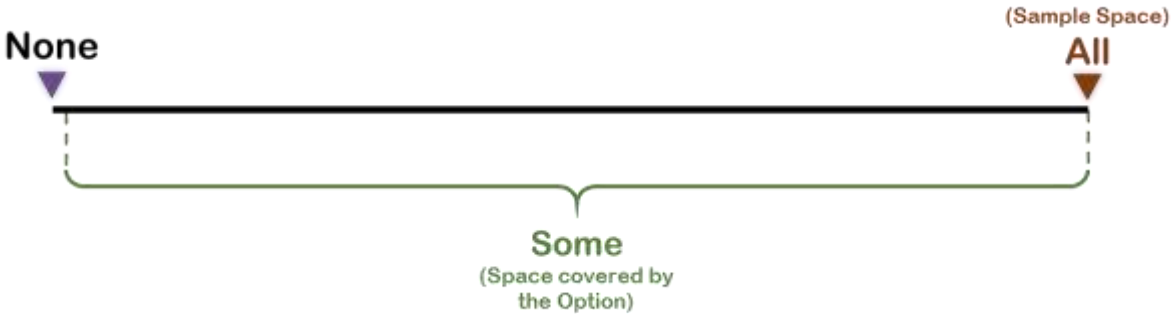
Answer Choice Explanation

A. Not every individual who hasn't taken a loan will say that EMIs are a headache.

Incorrect – Wrong Segment

This choice talks about individuals who have NOT taken a loan. We don't need to consider it any further.

B. Only some individuals who have taken a loan will say that EMIs are a headache.



Incorrect: The space covered by the option overlaps with the sample space of the given statement. Therefore, this option fails to provide the right negated space. **Remember, the negated space contains only the possibilities OUTSIDE the original sample space.**

C. No individual who has taken a loan will say that EMIs are a headache.

Incorrect: The space covered by the option doesn't include all the possibilities that lie outside the original sample-space. **Remember, the logical negation of a statement should account for all the possibilities lying outside the sample space of the given statement.** Therefore, this option cannot be the logical negation of the given statement.

D. At least one individual who has taken a loan will say that EMIs are a headache.

Incorrect: This is essentially the same as Option B, since saying that ***at least 1 person does X*** **means the same as saying *some people do X***. Think about it! *At least one person did X* means that we know for sure that 1 out of the given segment definitely did X – the number could be more; it could be even *all*, but we know for sure that at least one person was involved. This gives us the same sample space as *some* (1-100). Therefore, this option cannot be the logical negation of the given statement.

E. Not every individual who has taken a loan will say that EMIs are a headache.

"Not every" is same as "Not all".

*not every = not all

Correct: As you can see, the diagrammatic representation above matches the Possibility Line diagram we come up with before evaluating the options statements.

The space covered by the option covers all the possibilities outside the possibility point denoted by *all*. Therefore, option E is the logical negation of the given statement.

You are now ready to move to the **exercise questions** to check your understanding of how to negate statements.

Good luck! ☺

EXERCISE QUESTIONS

*At this stage, your focus should not be on memorizing the group-markers but rather on mastering their understanding while negating statements. Therefore, for ready reference, please find below the list of commonly used group-markers. You may need to refer to this list while answering the exercise questions.

Term	Logical Opposite
All (100)	Not All (0-99)
Some (at least one)	None (Notice that "Some" includes **everything except 0**)
Not All	All
Most	Not more than half (0-50)
None	Some (at least one)
Exactly X	Not Exactly X (Note that the sample space is both before X and after X, just not X)
Significant	Insignificant
Never	Sometimes
Always	Not Always
Everywhere	Not everywhere

Identify the correct negations for the following statements.

1. Most websites that are developed with a proper focus on SEO get a significant number of visitors.
    a. 49% of the websites that are developed without a proper focus on SEO get a significant number of visitors.
    b. All websites that are developed with a proper focus on SEO get a significant number of visitors.
    c. Some websites that are developed with a proper focus on SEO get a significant number of visitors.
    d. Up to 50% of the websites that are developed with a proper focus on SEO get a significant number of visitors.

2. Some people over 60 years of age are conservative investors.
    a. Not all people over 60 years of age are conservative investors.
    b. No person over the age of 60 is a conservative investor.
    c. Not everyone over 60 is a conservative investor.
    d. Most people are conservative investors.

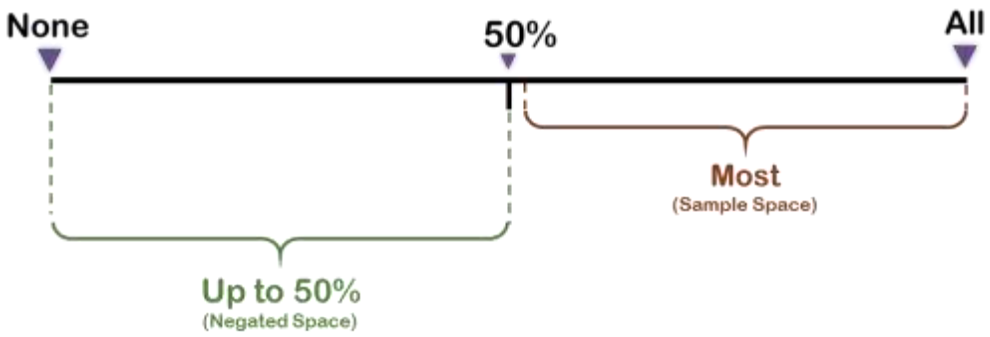
3. Up to 70% of the laptops powered by HCD processor are prone to over-heating issues.
    a. Not every laptop powered by HCD processor is prone to over-heating issues.
    b. Some laptops that are not powered by HCD processor are prone to over-heating issues.
    c. 70% or more laptops powered by HCD processor are prone to over-heating issues.
    d. More than 70% laptops powered by HCD processor are prone to over-heating issues.

4. Any GMAT taker will agree that the GMAT is a mentally gruelling exam.
    a. Only some GMAT takers will agree that the GMAT is a mentally gruelling exam.
    b. Not more than half of the GMAT takers will agree that the GMAT is a mentally gruelling exam.
    c. Not every GMAT taker will agree that the GMAT is a mentally gruelling exam.
    d. No GMAT taker will agree that the GMAT is a mentally gruelling exam.

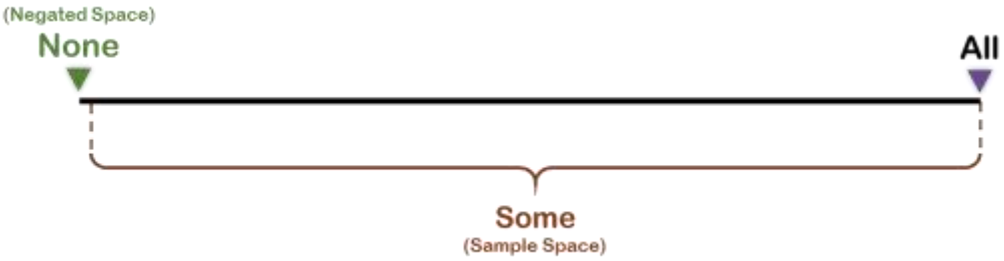
ANSWER KEY

Correct Answers:

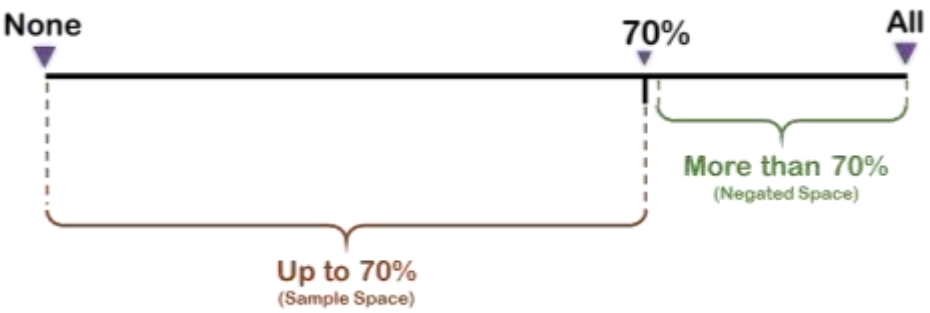
1. d



2. b



3. d



4. c

"*Any GMAT taker will agree*" is same as "*All GMAT takers will agree*".

"*Not all GMAT takers will agree*" is same as "*Not every GMAT taker will agree*"