

# GMAT Prep

## Data Insights 4





# Data Sufficiency

*Directions:*

This data sufficiency problem consists of a question and two statements, labeled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the data given in the statements, plus your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word counterclockwise), you must indicate whether:

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

1. Is  $a > b$ ?

(1)  $a - 3 > b - 3$

(2)  $a^2 > ab$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

2. Is  $m > n$ ?

(1)  $mx > nx$

(2)  $mx^2 > nx^2$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

3. Is  $y > z$ ?

(1)  $y = \frac{3}{2}z$

(2)  $y^2 > z^2$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

4.  $X + Y = 4$ . Is  $X > Y$ ?

(1)  $X^2 > Y^2$

(2)  $Y < 0$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

5. Is  $\frac{a^2}{b} > 0$ ?

(1)  $-1 < a < 1$

(2)  $-3 < b < 3$

A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.

B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.

C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.

D. EACH statement ALONE is sufficient to answer the question asked.

E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.





# Data Sufficiency

6. Is  $xy > 1$ ?

(1)  $x^y = 1$

(2)  $y = -1$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

7. Is  $a > 0$ ?

- (1)  $b < a$
- (2)  $-a < b$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
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# Data Sufficiency

8. Is  $5\frac{a^2}{b} < 1$ ?

(1)  $a < 0$

(2)  $b < 0$

A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.

B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.

C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.

D. EACH statement ALONE is sufficient to answer the question asked.

E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

9. Is  $x < y$ ?

(1)  $|x| < |y|$

(2)  $y = |y|$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
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# Data Sufficiency

10. Is  $|x - 5| > |x - 25|$  ?

(1)  $x > 10$

(2)  $x > 20$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

11. What is the value of  $a$ ?

(1)  $|a + 3| = 3|a - 3|$

(2)  $a > 3$

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
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# Data Sufficiency

12. In a real estate office that employs  $n$  salespeople,  $f$  of them are females and  $x$  of the females are new employees. What is the value of  $n$  ?
- (1) If an employee were randomly selected from the  $n$  employees, the probability of selecting a female would be  $\frac{2}{3}$ .
- (2) If an employee were randomly selected from the  $f$  female employees, the probability of selecting a new employee would be  $\frac{1}{2}$ .
- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
- D. EACH statement ALONE is sufficient to answer the question asked.
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.



# Data Sufficiency

13. Each of the marbles in a jar is either red or white or blue. If one marble is to be selected at random from the jar, what is the probability that the marble will be blue?
- (1) There are a total of 24 marbles in the jar, 8 of which are red.
  - (2) The probability that the marble selected will be white is  $\frac{1}{2}$ .
- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked.
  - B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked.
  - C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient to answer the question asked.
  - D. EACH statement ALONE is sufficient to answer the question asked.
  - E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.





# Multi-Source Reasoning

## Multi-Source Reasoning

Measures your ability to examine data from multiple sources including text passages, tables, graphics, or some combination of the three—and to analyze each source of data carefully to answer multiple questions. Some questions will require you to recognize discrepancies among different sources of data, while others will ask you to draw inferences, or require you to determine whether data is relevant.

- Two or three tabs on the left side of your screen. Each tab shows a written passage, a table, a graph, or another form of information. The different tabs may show information in different forms. You click on the tabs to see what’s on them and find what you need to answer the questions. Text near the graphic may clarify what the graphic means. The text may also give information that’s not in the graphic but is needed to answer the question.
- A question with answer choices on the right side of your screen. With each set of tabs, three questions appear one at a time.
- Some questions are traditional multiple choice, with five answer choices. Others are “conditional statement” questions. This means that each question gives a condition. Below that are three rows with contents such as sentences, phrases, words, numbers, or formulas. For each row, mark “yes” or “true” if the row’s contents meet the given condition, and “no” or “false” otherwise. Mark one answer PER ROW. You must mark all three rows correctly to get credit for the question.
- You need to understand what each question is asking you to do. For example, some questions ask you to spot conflicts between the information sources. Others ask you to draw conclusions by combining information from different sources. Some questions ask you to judge which information sources are relevant to a question. While answering the questions, you can always click on the tabs to review any of the information.



# Multi-Source Reasoning

Email 1	Email 2	Email 3
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*Email from the **administrator** to research staff.*

*January 15, 10:46 a.m.*

Yesterday was the deadline for our receipt of completed surveys from doctors who were invited to participate in the Medical Practice Priorities Survey. Did we get enough returns from this original group of invitees to get reliable statistics? Do we need to invite additional participants?



# Multi-Source Reasoning

Email 1

Email 2

Email 3

*Email from project coordinator in response to the administrator's January 15, 10:46 a.m. message.*

*January 15, 11:12 a.m.*

Altogether we got exactly 350 actual survey completions. We need at least 700 and were hoping for even more, so we plan to invite a second group to participate. Both the results from this first group and other research indicates that with this type of survey and this type of participants there is about a 40 percent probability that any given invitee will submit the completed survey in the time we'll allow. (Obviously that doesn't mean that if we invited 1,000 we'd necessarily get at least 400, so we need to think in terms of the risks of getting too few returns or exceeding the budget.) All of the participants who submitted their surveys by the deadline will get the \$50 payment we promised. What is our total budget for compensation to participants?



# Multi-Source Reasoning

Email 1

Email 2

Email 3

*Email from administrator to project coordinator in response to the project coordinator's January 15, 11:12 a.m. message*

*January 15, 1:54 p.m.*

The budget we allocated for compensation to those who complete and submit the Medical Practice Priorities Survey is \$45,000. We will honor our commitment to pay \$50 to each participant--in the second group as well as the first--who completes the survey and submits it by the deadline we specify when we invite them to participate. However, we will need to try not to exceed the total amount that is budgeted for this purpose.



# Multi-Source Reasoning

14. Consider each of the following statements. Does the information in the three emails support the inference as stated?

Yes	No	
<input type="radio"/>	<input type="radio"/>	The administrator is unwilling to invite as many participants in the second group as were invited in the first group.
<input type="radio"/>	<input type="radio"/>	The project coordinator does not expect to be able to meet the goal for numbers of completed surveys received.
<input type="radio"/>	<input type="radio"/>	The administrator is willing to accept some risk of exceeding the budget for compensating participants.



# Multi-Source Reasoning

15. Suppose that the total number of invitees in the second group is 560. Then, if all of the information in the three emails is accurate, the probability that the budget for compensating participants will be exceeded is nearest to:
- A. 1.00
  - B. 0.80
  - C. 0.50
  - D. 0.20
  - E. 0.00



# Multi-Source Reasoning

Techniques	Artifacts	Budget
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Island Museum analyzes historical artifacts using one or more techniques described below – all but one of which is performed by an outside laboratory – to obtain specific information about an object’s creation. For each type of material listed, the museum uses only the technique described:

Animal teeth or bones: The museum performs *isotope ratio mass spectrometry* (IRMS) in - house to determine the ratios of chemical elements present, yielding clues as to the animal’s diet and the minerals in its water supply.

Metallic ores or alloys: *Inductively coupled plasma mass spectrometry* (ICP–MS) is used to determine the ratios of traces of metallic isotopes present, which differ according to where the sample was obtained.

Plant matter: While they are living, plants absorb carbon-14, which decays at a predictable rate after death; thus *radiocarbon dating* is used to estimate a plant’s date of death.

Fired-clay objects: *Thermoluminescence* (TL) dating is used to provide an estimate of the time since clay was fired to create the object.



# Multi-Source Reasoning

Techniques	Artifacts	Budget
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Island Museum has acquired a collection of metal, fired clay, stone, bone, and wooden artifacts found on the Kaxna Islands, and presumed to be from the Kaxna Kingdom of 1250-850 BC. Researchers have mapped all the mines, quarries, and sources of clay on Kaxna and know that wooden artifacts of that time were generally created within two years after tree harvest. There is, however, considerable uncertainty as to whether these artifacts were actually created in Kaxna.

In analyzing these artifacts, the museum assumes that radiocarbon dating is accurate to approximately  $\pm 200$  years and TL dating is accurate to approximately  $\pm 100$  years.





# Multi-Source Reasoning

Techniques	Artifacts	Budget
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For outside laboratory tests, the museum's first –year budget for the Kaxna collection allows unlimited IRMS testing, and a total of \$ 7,000 – equal to the cost of 4TL tests plus 15 radiocarbon tests, or the cost of 40 ICP-MS tests—for all other tests. For each technique applied by an outside lab, the museum is charged a fixed price per artifact.



# Multi-Source Reasoning

16. For each of the following artifacts in the museum's Kaxna collection, select Yes if, based on the museum's assumptions, a range of dates for the object's creation can be obtained using one of the techniques in the manner described. Otherwise, select No.

Yes	No	
<input type="radio"/>	<input type="radio"/>	Bronze statue of a deer
<input type="radio"/>	<input type="radio"/>	Fired-clay pot
<input type="radio"/>	<input type="radio"/>	Wooden statue of a warrior



# Multi-Source Reasoning

17. For each of the following results of tests performed on Kaxna artifacts, select Yes if, based on the museum's assumptions, the result confirms that the artifact was created during the time of Kaxna Kingdom. Otherwise, select No.

Yes	No	
<input type="radio"/>	<input type="radio"/>	Bone necklace shown by IRMS to have element ratios characteristics of artifacts known to be from the Kaxna Kingdom
<input type="radio"/>	<input type="radio"/>	Fired-clay jug dated to 1050 BC by TL dating
<input type="radio"/>	<input type="radio"/>	Copper box shown by ICP – MS to have the same ratio of trace metals found in the copper mines of Kaxna



# Multi-Source Reasoning

18. For each of the following combinations of Kaxna artifacts, select Yes if, based on the information provided, the cost of all pertinent techniques described can be shown to be within the museum's first-year Kaxna budget. Otherwise select, No.

Yes	No	
<input type="radio"/>	<input type="radio"/>	2 fired-clay statues and 10 bronze statues.
<input type="radio"/>	<input type="radio"/>	3 fired-clay statues and 5 tin implements.
<input type="radio"/>	<input type="radio"/>	4 fired-clay pots and 20 wooden statues.





*Thank you*