



კავკასიის უნივერსიტეტი
CAUCASUS UNIVERSITY

Caucasus University

Math Test

Exam Duration: 120 minutes

Your mobile phone must be switched off and in your pocket/bag throughout the exam.

Student Name, Surname:

ID Number:

Rules and Regulations Concerning Taking the Exam

- The examination is monitored by the Proctor, from authorised Administration personal. Students are to follow his/her instruction and can ask for clarification.
- Students are not allowed to use their mobile phones during the examination. Mobile phones are to be turned off during the process, and in their pockets, or bags. No other electronic devices (including a mobile phone) can be used. If, and when, any of the students violets the regulation he/she will be dismissed from the examination.
- When answering multiple choice questions only one correct answer shall be circled except the cases when there are two or more correct answers. The answer shall be deemed incorrect if one or more answers are crossed out and another one is circled, unless the circled choice is clear.
- No student is allowed to leave the auditorium during the examination.
- Students are not allowed to use calculator.
- Blank parts of the pages can be used for calculations.

1) If the average (arithmetic mean) of a and b is 55, and the average (arithmetic mean) of b and c is 25, then $a - c =$

A) 60

B) 50

C) 40

D) 30

E) 20

2) The current ratio of boys to girls at a certain school is 2 to 5. If 12 additional boys were added to the school, the new ratio of boys to girls would be 4 to 9. How many boys currently attend the school?

A) 27

B) 48

C) 54

D) 72

E) 108

3) George can paint a house three times faster than David can paint a house. If, working together, it takes George and David 24 hours to paint a house, then how many hours will it take George to paint a house alone?

A) 18

B) 26

C) 28

D) 30

E) 32

4) What is the largest integer n such that $\frac{1}{2^n} > 10^{-2}$?

A) 5

B) 6

C) 7

D) 10

E) 51

5) If the length and width of a rectangular garden plot were each increased by 20 percent, what would be the percent increase in the area of the plot?

A) 20%

B) 24%

C) 40%

D) 44%

E) 144%

6) Among a group of 2500 people, 35 percent invest in municipal bonds, 18 percent invest in oil stocks, and 7 percent invest in both municipal bonds and oil stocks. If 1 person is to be randomly selected from the 2500 people, what is the probability that the person selected will be one who invests in municipal bonds but NOT in oil stocks?

A) $\frac{9}{50}$

B) $\frac{7}{20}$

C) $\frac{7}{25}$

D) $\frac{21}{50}$

E) $\frac{27}{50}$

7) Nino deposited \$10000 to open a new savings account that earned 4 percent annual interest, compounded quarterly. If there were no other transactions in the account, what was the amount of money in Nino's account 6 months after the account was opened?

A) \$10100

B) \$10101

C) \$10200

D) \$10201

E) \$10400

8) The production costs per day for some widget is given by,

$$C(x) = 2500 - 10x - 0.01x^2 + 0.0002x^3 .$$

What is the marginal cost when $x = 200$ (the marginal cost is the first derivative of the cost function $C(x)$ with respect to the quantity x).

A) 5

B) 10

C) 15

D) 20

E) 25

Each of the critical reasoning questions presented below is based on a short argument, a set of statements, or a plan of action. For each question, select the best answer of the choices given.

- 9) Homeowners aged 40 to 50 are more likely to purchase ice cream and are more likely to purchase it in larger amounts than are members of any other demographic group. The popular belief that teenagers eat more ice cream than adults must, therefore, be false.

The argument is flawed primarily because the author

- A) fails to distinguish between purchasing and consuming
- B) does not supply information about homeowners in age groups other than 40 to 50
- C) depends on popular belief rather than on documented research findings
- D) does not specify the precise amount of ice cream purchased by any demographic group
- E) discusses ice cream rather than more nutritious and healthful foods

10) A company is considering changing its policy concerning daily working hours. Currently, this company requires all employees to arrive at work at 8 a.m. The proposed policy would permit each employee to decide when to arrive—from as early as 6 a.m. to as late as 11 a.m.

The adoption of this policy would be most likely to decrease employees' productivity if the employees' job functions required them to

- A) work without interruption from other employees
- B) consult at least once a day with employees from other companies
- C) interact frequently with each other throughout the entire workday
- D) submit their work for a supervisor's eventual approval
- E) undertake projects that take several days to complete