



SECTION 3

TEST II (MATHEMATICS) SAMPLE QUESTIONS

This section of the Georgia Assessments for the Certification of Educators® (GACE™) Preparation Guide provides sample selected-response questions with an annotated answer key for you to review as part of your preparation for the test. The sample selected-response questions are designed to illustrate the nature of the test questions. Work through the questions carefully before referring to the annotated answer key, which follows the sample selected-response questions. The answer key provides the correct response to each question, describes why each correct response is the best answer, and lists the objective within the test framework to which each question is linked.

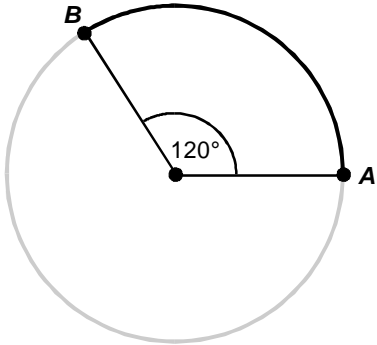
Please note that definitions and formulas are provided for this test. Please refer to these materials as needed in responding to the sample test questions. These materials are located in the Assessment Reference Materials section at the end of this preparation guide.

QUESTIONS

1. A pair of jeans originally sold for \$80. They are now on sale for 20% off. What is the sale price?
 - A. \$60
 - B. \$64
 - C. \$74
 - D. \$76

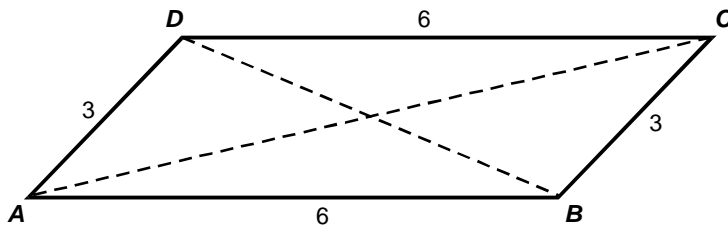
2. Which of the following expressions is equivalent to $5 - 4(6 + 2)$?
 - A. $5 - (4 \times 6) + 2$
 - B. $5 - [(4 \times 6) + 2]$
 - C. $5 - (4 \times 6) - (4 \times 2)$
 - D. $5 - (4 \times 6) + (4 \times 2)$

3. Use the diagram below to answer the question that follows.



The circle above has a circumference of 24 cm. What is the length of arc AB ?

- A. 4 cm
 - B. 6 cm
 - C. 8 cm
 - D. 12 cm
4. Use the diagram below to answer the question that follows.

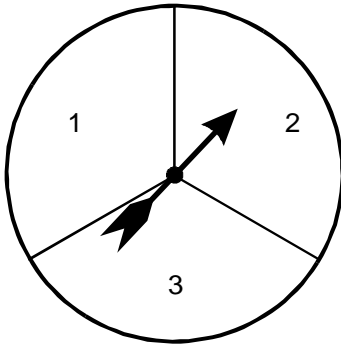


Which of the following statements about $ABCD$ must be true?

- A. \overline{AB} is perpendicular to \overline{BC} .
- B. $m\angle ABC$ is equal to $m\angle BCD$.
- C. \overline{AC} is equal in length to \overline{BD} .
- D. \overline{AD} is parallel to \overline{BC} .

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5. Use the diagram below to answer the question that follows.



Each section of the above spinner is equal in area. If the spinner is spun twice, what is the probability of getting a 2 on the first spin and a 3 on the second spin?

- A. $\frac{1}{9}$
- B. $\frac{1}{3}$
- C. $\frac{5}{9}$
- D. $\frac{2}{3}$

6. A company that produces air conditioners wants to determine how much energy their air conditioner uses. They have decided to select and test 50 units for energy use. Which of the following is likely to be the most statistically valid way of selecting the machines for the study?
- A. have manufacturing managers select the 50 machines
 - B. randomly select the 50 machines
 - C. test each machine prior to selecting it for the study
 - D. identify which machines to test at the start of the production process
7. **Use the information below to answer the question that follows.**

Problem

A room contains N people. Each person shakes hands with everyone else in the room exactly once. How many handshakes occur?

Solution

Step 1. Multiply N by itself.

Step 2. Subtract N from the result from step 1.

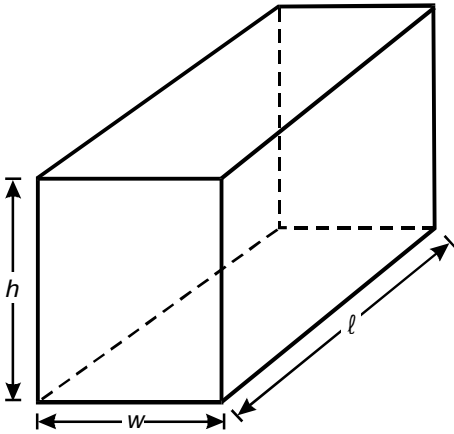
Step 3. Divide the result from step 2 by 2.

Using the above procedure, find the number of handshakes that occur if the room contains 10 people.

- A. 45
- B. 50
- C. 90
- D. 100

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8. Use the diagram below to answer the question that follows.



What is the surface area of the rectangular solid shown above if $w = 2$ units, $h = 3$ units, and $l = 4$ units?

- A. 36 units²
- B. 40 units²
- C. 42 units²
- D. 52 units²

ANNOTATED ANSWER KEY

For question	The correct response is	Reason	Test Objective
1	B	To find the sale price, first find 20% of the original price and then subtract that amount from the original price. Since $20\% = 20/100 = 0.20$, 20% of \$80 is equal to $0.20 \times \$80 = \16 . The sale price is then $\$80 - \$16 = \$64$.	0007
2	C	The distributive law states that $a(b + c) = ab + ac$. If a is negative this becomes, $-a(b + c) = -ab - ac$. Applying this law to the given expression results in $5 - 4(6 + 2) = 5 - (4 \times 6) - (4 \times 2)$.	0007
3	C	The central angle of a circle measures 360° . The angle subtended by arc AB in the circle shown is 120° . The length of the arc is therefore $\frac{120^\circ}{360^\circ}$ or $\frac{1}{3}$ of the length of the circumference of the circle. Since the circumference is 24 cm in length, the length of the arc AB is $\frac{1}{3}$ of 24 cm or 8 cm.	0008
4	D	From the information given in the diagram, the opposite sides of quadrilateral $ABCD$ are equal in length. This implies that quadrilateral $ABCD$ is a parallelogram. Since, by definition, the opposite sides of a parallelogram are parallel, \overline{AD} is parallel to \overline{BC} .	0008
5	A	If the spinner is spun twice, there are 9 possible outcomes: $(1, 1)$, $(1, 2)$, $(1, 3)$, $(2, 1)$, $(2, 2)$, $(2, 3)$, $(3, 1)$, $(3, 2)$, $(3, 3)$. Of these possible outcomes, there is only one outcome that involves getting a 2 on the first spin and a 3 on the second spin, namely $(2, 3)$. The probability of this event occurring is thus $\frac{1}{9}$.	0009
6	B	Statistical sampling involves selecting a relatively small subset (sample) of elements from a large population and using properties of the sample to make inferences about the larger population. There is always uncertainty and error in this process. One way to minimize the error and uncertainty and increase the validity of the process is to randomly select the elements in the sample.	0009

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For question	The correct response is	Reason	Test Objective
7	A	<p>Since there are 10 people in the room, $N = 10$. Follow the steps as shown below.</p> <p>Step 1. Multiply N by itself which results in $10 \times 10 = 100$.</p> <p>Step 2. Subtract N from the result from step 1 which gives $100 - 10 = 90$.</p> <p>Step 3. Divide the result from step 2 by 2 which results in $90 \div 2 = 45$.</p>	0010
8	D	<p>The surface of the rectangular solid consists of 6 rectangles. The area of a rectangle is the length times width. Two rectangles have an area $l \times w$, two have an area of $l \times h$, and two have area of $w \times h$. The area is then $2lw + 2lh + 2wh$ (see formula page). Since $w = 2$ units, $h = 3$ units, and $l = 4$ units, the area becomes $2(4 \times 2) + 2(4 \times 3) + 2(2 \times 3) = 52$ units².</p>	0010