

Basic Mathematics Aptitude Test

2025

- The test is a computer-scored multiple-choice test.
- You have 60 minutes to complete.
- No calculators are allowed.
- Part I and Part II are ‘Basic Math,’ and Part III, IV and V are ‘Applied Math.’
- Select one(1) integer 0 to 9 for each square.
- Each square correspond to each answer number of computer-scored answer sheet.

Please select integer number that correspond to .

➤ $3 \times 8 =$ (2 digits)



No.	Answer
1	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
2	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
3	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
4	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

Application Number: _____

Name: _____

(Please show all your work here and write your answers in the designated space)

[PART I] Calculate the followings.

1. $5 - 2 \times [3 + (6 - 9)]$

Answer :

→ No.1

2. $\left(\frac{3}{4} \div 1.5\right) \div \left(\frac{3}{10} - \frac{4}{5}\right) + \frac{3}{5} \div \left(\frac{2}{5} - 0.2\right)$

Answer :

→ No.2

3. $(\sqrt{12} - \sqrt{27}) + \sqrt{3}$

Answer :

→ No.3

4. $\left(3^2 \times \left(\frac{1}{3}\right)^2\right)^3 \div \left(\frac{1}{3}\right)^2$

Answer :

→ No.4

[PART II] Answer the following questions.

Answer :  No.5

$$-2x + 8y = 4$$

Answer : $x = \square$, $y = \square$

 No.6  No.7

3. Find the region x satisfying the following inequality, where $||$ indicates the absolute value.

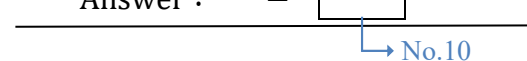
$$|x + 1| \leq 2$$

Answer : $- \boxed{} \leq x \leq \boxed{}$



4. Find the arithmetic mean difference between the following observations of two variables x_i and y_i , denoted as $Mean(x_i) - Mean(y_i)$, where $x_i = \{1, 2, 3, 4, 5\}$ and where $y_i = \{2, 4, 6, 8, 10\}$

Answer : $- \boxed{}$



(Please show all your work here and write your answers in the designated space)
[PART III] Answer the following questions:

1. Solve the following equation for x . Consider only real number solutions.

$$\frac{x^2}{3} - 4 = 8$$

Answer : $x = \pm$

↪ No.11

2. Find the region of x satisfying the following inequality.

$$3x^2 - 5x < x^2 + 2x - 3$$

Answer :

$< x <$

↪ No.12

↪ No.13

↪ No.14

3. Solve the following equation for x .

$$2\log_3(x) = \log_3(4 + 2x - x^2)$$

Answer : $x =$

 No.15

4. Consider the following six values, [8, 5, 4, 10, 14, 12]. Find $\log_3(x)$ where x is the median of the six values.

Answer : $\log_3 x =$

 No.16

(Please show all your work here and write your answers in the designated space)
[PART IV] Answer the following questions:

1. Determine the first-order derivative of the following. Note that log is the natural logarithm.

$$y = \log_e x + 3x^0$$

Answer : $y' = \frac{\boxed{}}{x}$ No.17

2. Find the following definite integral.

$$\int_0^2 (2x + 3x^2) dx$$

Answer : (2 digits)

↙
No.18

↙
No.19

3. Let $A = \begin{bmatrix} a & -1 \\ -2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$.

Assume determinant of matrix A is 1. Find $A^{-1}B$.

Answer :

No.20
 No.22
 No.21
 No.23

4. Find the value of x and y that solves the following constrained maximization problem:
 Maximize $\sqrt{3xy}$ subject to $3x + y = 12$.

Answer: $x =$, $y =$

No.24
 No.25

(Please show all your work here and write your answers in the designated space)

[PART V] Answer the following questions:

- Find the first derivative of the following. $f(\theta) = \sin\left(\frac{3}{2}\theta\right)$

Answer :

 $\cos\left(\frac{\text{No.26}}{\text{No.27}}\theta\right)$ No.28
No.29

- Given a sequence 4^{n-1} , find the value $\sum_{n=1}^3 4^{n-1}$, where n is an integer.

Answer :

--

--

 (2 digits)
No.30 No.31

3. Suppose that $\vec{a} = (3x + 6, 3)$ and $\vec{b} = (2, y)$ are vertical and that $x + y = -2$.
Find x and y .

Answer: $x = -$, $y =$

No.32 No.33

4. In the public policy course, there are six students majoring in economics and five students majoring in public management. The professor plans to form a group work by selecting three members from each major group. Find the total number of different teams that can be formed.

Answer : (3 digits)

No.34 No.35 No.36