Test: MU

Points: 15 points

Name: _____

Date: _____

NOTA = None of these answers is correct.

Question 1 of 15 1 pt

Find the average value of $f(x) = \sin\frac{x}{2}$ on the interval $-4 \le x \le 0$.

- **A)** $\frac{\cos 2}{2} + 1$
- **B)** $1 - \cos 2$
- **C)** $\frac{\cos 2}{2} - \frac{1}{2}$
- **D)** $\frac{\cos 4 - 1}{4}$
- **E)** NOTA

Question 2 of 15 1 pt

The six-digit number 3730N5, where N is the tens digit, is divisible by 21.

What is the sum of the positive integral factors of N?

- **A)** 4
- **B)** 15
- **C)** 12
- **D)** 7
- **E)** NOTA

Question 3 of 15

1 pt

Find the area of the region bounded by the graphs of $y = e^{-x}$, the x-axis, and the lines $x = 0$ and $x = 2$.

- **A)** 1
- **B)** $1 - \frac{1}{e^2}$
- **C)** $e - 1$
- **D)** $\frac{1}{e^2}$
- **E)** NOTA

Question 4 of 15

1 pt

Find the value of $x^2 + y^2 + z^2$, where x, y, and z satisfy the following system.

$x + y - z = 8$
$2x - y = 3$
$y + z = 6$

- **A)** 38
- **B)** 42
- **C)** 70
- **D)** 107
- **E)** NOTA

Question 5 of 15

1 pt

Which of the following statements is/are true? Assume that f is a function whose domain and range are subsets of the real numbers.

1) If f is continuous everywhere, then f is differentiable everywhere.
2) If f is differentiable everywhere, then f is continuous everywhere.
3) If f is continuous and $f(x) \geq 3$ for every x in $[4, 8]$, then $\int_4^8 f(x)\,dx > 9$.

- **A)** 2 only
- **B)** 1 and 2
- **C)** 1 and 3
- **D)** 1, 2, 3
- **E)** NOTA

Question 6 of 15

1 pt

Given polynomial $P(x)$ find the product of the roots taken two at a time.

$$P(x) = x^3 - 4x^2 + 10x - 16$$

- **A)** 40
- **B)** 64
- **C)** 160
- **D)** 256
- **E)** NOTA

Question 7 of 15

1 pt

Which of the following are true about proving similar/congruent triangles?

I. If two angles of a triangle are congruent then the two triangles are similar.

II. If two pairs of corresponding sides are in proportion and there exists an equal angle that both the triangles share then the two triangles are similar.

III. If three pairs of corresponding sides are in proportion then the two triangles are similar.

- **A)** I only
- **B)** II and III
- **C)** I and III
- **D)** All of the above
- **E)** NOTA

Question 8 of 15

1 pt

Seven coins are flipped behind a screen, and a reliable source tells you that at least two of them are heads. What is the probability that at most five of them are heads?

- **A)** 29/30
- **B)** 7/8
- **C)** 13/15
- **D)** 23/24
- **E)** NOTA

Question 9 of 15

1 pt

Evaluate: $\frac{1}{2}+\frac{2}{3}+\frac{1}{4}+\frac{1}{3}+\frac{1}{8}+\frac{1}{6}+\cdots$

- **A)** Diverges
- **B)** 15/2
- **C)** 4/3
- **D)** 7/3
- **E)** NOTA

Question 10 of 15

1 pt

A rectangular sheet of paper measures 48 decimeters by 55 decimeters. One corner is folded onto the diagonally opposite corner and then the paper is creased. The length of the crease is m/n decimeters, where m and n are relatively prime natural numbers. What is the value of m+n?

- **A)** 7519
- **B)** 5320
- **C)** 4063
- **D)** 3559
- **E)** NOTA

Question 11 of 15

1 pt

Compute the sum of the solutions to the equation $\tan^2(x)+\frac{4\sqrt{3}}{3}\tan(x)+1=0$ on the interval $[-\pi,\pi]$

- **A)** π
- **B)** $\frac{2\pi}{3}$
- **C)** $\frac{5\pi}{6}$
- **D)** $\frac{7\pi}{6}$
- **E)** NOTA

Question 12 of 15

1 pt

Find the sum of the coordinates of the point in the graph of $xy^2 - x^3y = 6$ that has a horizontal tangent line.

- A) 1
- B) 2
- C) 3
- D) 4
- E) NOTA

Question 13 of 15

1 pt

Solve for x if the infinite sum $\log_3(x) + \log_9(x) + \log_{81}(x) + \log_{6561}(x) + \ldots = 18.$

- A) 3^6
- B) 3^9
- C) 3^{12}
- D) 3^{18}
- E) NOTA

Question 14 of 15

1 pt

Can you crack this code? Include the exact punctuation when you type your answer in the blank:

Arire tbaan tvir lbh hc, arire tbaan yrg lbh qbja, arire tbaan eha nebhaq naq qrfreg lbh.

Question 15 of 15

1 pt

Dear puzzler, here is a list of things: integrals, unlimited breadsticks, scented dryer sheets, praseodymium, a lost pet colony on the moon, a flowing purple cape.

Using all of these unique tools, can you crack this code? Include the exact punctuation when you type your answer in the blank:

M pc lekmgql, pfs sgf’n apbb ce Lymkbex.