3 \int_0^1 \int_0^x xy \, dy \, dx =

(A) 0 \hspace{1cm} (B) \frac{1}{8} \hspace{1cm} (C) \frac{1}{3} \hspace{1cm} (D) 1 \hspace{1cm} (E) 3

4. For \( x \geq 0 \), \( \frac{d}{dx} (x^e \cdot e^x) = \)

(A) \( x^e \cdot e^x + x^{e-1} \cdot e^{x+1} \) \hspace{1cm} (B) \( x^e \cdot e^x + x^{e+1} \cdot e^{x-1} \) \hspace{1cm} (C) \( x^{e-1} \cdot e^x \) \hspace{1cm} (D) \( x^{e-1} \cdot e^{x+1} \) \hspace{1cm} (E) \( x^{e-1} \cdot e^{x-1} \)

5. All functions \( f \) defined on the \( xy \)-plane such that

\[ \frac{\partial f}{\partial x} = 2x + y \quad \text{and} \quad \frac{\partial f}{\partial y} = x + 2y \]

are given by \( f(x, y) = \)

(A) \( x^2 + xy + y^2 + C \) \hspace{1cm} (B) \( x^2 - xy + y^2 + C \) \hspace{1cm} (C) \( x^2 - xy - y^2 + C \)

(D) \( x^2 + 2xy + y^2 + C \) \hspace{1cm} (E) \( x^2 - 2xy + y^2 + C \)

GO ON TO THE NEXT PAGE
6 Which of the following could be the graph of the derivative of the function whose graph is shown in the figure above?

(A) \[\text{Graph A}\]

(B) \[\text{Graph B}\]

(C) \[\text{Graph C}\]

(D) \[\text{Graph D}\]

(E) \[\text{Graph E}\]
7. Which of the following integrals represents the area of the shaded portion of the rectangle shown in the figure above?

(A) \( \int_{-1}^{1} (x + 2 - |x|) \, dx \)  
(B) \( \int_{-1}^{1} (|x| + x + 2) \, dx \)  
(C) \( \int_{-1}^{1} (x + 2) \, dx \)  
(D) \( \int_{-1}^{1} |x| \, dx \)  
(E) \( \int_{-1}^{1} 2 \, dx \)

---

8. \( \sum_{n=1}^{\infty} \frac{n}{n + 1} = \)

(A) \( \frac{1}{e} \)  
(B) log 2  
(C) 1  
(D) \( e \)  
(E) \( +\infty \)

---

GO ON TO THE NEXT PAGE
9. \( k \) digits are to be chosen at random (with repetitions allowed) from \( \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\} \). What is the probability that 0 will not be chosen?

(A) \( \frac{1}{k} \)  \hspace{1cm}  (B) \( \frac{1}{10} \)  \hspace{1cm}  (C) \( \frac{k-1}{k} \)  \hspace{1cm}  (D) \( \left( \frac{1}{10} \right)^k \)  \hspace{1cm}  (E) \( \left( \frac{9}{10} \right)^k \)

10. In order to send an undetected message to an agent in the field, each letter in the message is replaced by the number of its position in the alphabet and that number is entered in a matrix \( M \). Thus, for example, “DEAD” becomes the matrix \( M = \begin{pmatrix} 4 & 3 \\ 1 & 4 \end{pmatrix} \). In order to further avoid detection, each message with four letters is sent to the agent encoded as \( MC \), where \( C = \begin{pmatrix} 2 & -1 \\ 1 & 1 \end{pmatrix} \). If the agent receives the matrix \( \begin{pmatrix} 51 & -3 \\ 31 & -8 \end{pmatrix} \), then the message is

(A) RUSH  \hspace{1cm}  (B) COME  \hspace{1cm}  (C) ROME  \hspace{1cm}  (D) CALL  \hspace{1cm}  (E) not uniquely determined by the information given

11. If \( \sin^{-1} x = \frac{\pi}{6} \), then the acute angle value of \( \cos^{-1} x \) is

(A) \( \frac{5\pi}{6} \)  \hspace{1cm}  (B) \( \frac{\pi}{3} \)  \hspace{1cm}  (C) \( \sqrt{1 - \frac{\pi^2}{6^2}} \)  \hspace{1cm}  (D) \( 1 - \frac{\pi}{6} \)  \hspace{1cm}  (E) 0

GO ON TO THE NEXT PAGE
12  $\int_{0}^{\pi} e^{\sin^2 x} \cos^2 x \, dx =$

(A) $\pi$  (B) $e\pi$  (C) $e^\pi$  (D) $e^{\sin^2 \pi}$  (E) $e^\pi - 1$

13. Which of the following is true of the behavior of $f(x) = \frac{x^3 + 8}{x^2 - 4}$ as $x \to 2$?

(A) The limit is 0
(B) The limit is 1
(C) The limit is 4
(D) The graph of the function has a vertical asymptote at 2.
(E) The function has unequal, finite left-hand and right-hand limits

14. A newscast contained the statement that the total use of electricity in city A had declined in one billing period by 5 percent, while household use had declined by 4 percent and all other uses increased by 25 percent. Which of the following must be true about the billing period?

(A) The statement was in error.
(B) The ratio of all other uses to household use was $\frac{29}{1}$.
(C) The ratio of all other uses to household use was $\frac{29}{16}$.
(D) The ratio of all other uses to household use was $\frac{29}{19}$.
(E) None of the above

GO ON TO THE NEXT PAGE
15 If \( f \) is a linear transformation from the plane to the real numbers and if \( f(1, 1) = 1 \) and \( f(-1, 0) = 2 \), then \( f(3, 5) = \)

(A) \(-6\)  (B) \(-5\)  (C) \(0\)  (D) \(8\)  (E) \(9\)

16 Suppose that an arrow is shot from a point \( p \) and lands at a point \( q \) such that at one and only one point in its flight is the arrow parallel to the line of sight between \( p \) and \( q \). Of the following, which is the best mathematical model for the phenomenon described above?

(A) A function \( f \) differentiable on \([a, b]\) such that there is one and only one point \( c \) in \([a, b]\) with
\[
\int_a^b f'(x) \, dx = \left( \frac{b}{b-a} \right) \cdot \left( f(b) - f(a) \right)
\]

(B) A function \( f \) whose second derivative is at all points negative such that there is one and only one point \( c \) in \([a, b]\) with
\[
f''(c) = \frac{f(b) - f(a)}{b - a}
\]

(C) A function \( f \) whose first derivative is at all points positive such that there is one and only one point \( c \) in \([a, b]\) with
\[
\int_a^b f(x) \, dx = f(c) \cdot (b - a)
\]

(D) A function \( f \) continuous on \([a, b]\) such that there is one and only one point \( c \) in \([a, b]\) with
\[
\int_a^b f(x) \, dx = f(c) \cdot (b - a)
\]

(E) A function \( f \) continuous on \([a, b]\) and \( f(a) < d < f(b) \) such that there is one and only one point \( c \) in \([a, b]\) with
\[
f(c) = d
\]

GO ON TO THE NEXT PAGE
17. Let $\ast$ be the binary operation on the rational numbers given by $a \ast b = a + b + 2ab$. Which of the following are true?

I. $\ast$ is commutative.
II. There is a rational number that is a $\ast$-identity.
III. Every rational number has a $\ast$-inverse.

(A) I only  
(B) II only  
(C) I and II only  
(D) I and III only  
(E) I, II, and III

18. A group $G$ in which $(ab)^2 = a^2b^2$ for all $a, b$ in $G$ is necessarily

(A) finite
(B) cyclic
(C) of order two
(D) abelian
(E) none of the above

19. If $c > 0$ and $f(x) = e^x - cx$ for all real numbers $x$, then the minimum value of $f$ is

(A) $f(c)$  
(B) $f(e^c)$  
(C) $f\left(\frac{1}{c}\right)$  
(D) $f(\log c)$  
(E) nonexistent

GO ON TO THE NEXT PAGE
20. Suppose that \( f(1 + x) = f(x) \) for all real \( x \). If \( f \) is a polynomial and \( f(5) = 11 \), then \( f\left(\frac{15}{2}\right) \) is

(A) \(-11\)  
(B) 0  
(C) 11  
(D) \(\frac{33}{2}\)  
(E) not uniquely determined by the information given

21. For all \( x > 0 \), if \( f(\log x) = \sqrt{x} \), then \( f(x) = \)

(A) \(e^x\)  
(B) \(\log \sqrt{x}\)  
(C) \(e^{\sqrt{x}}\)  
(D) \(\sqrt{\log x}\)  
(E) \(\frac{\log x}{2}\)

22. \(\int_0^1 \left(\int_0^1 \frac{x \sin y - 1}{\sqrt{1 - x^2}} \, dx\right) \, dy = \)

(A) \(\frac{1}{3}\)  
(B) \(\frac{1}{2}\)  
(C) \(\frac{\pi}{4}\)  
(D) 1  
(E) \(\frac{\pi}{3}\)
26 If \( k \) is a real number and

\[
f(x) = \begin{cases} \sin \frac{1}{x} & \text{for } x \neq 0 \\ k & \text{for } x = 0 \end{cases}
\]

and if the graph of \( f \) is not a connected subset of the plane, then the value of \( k \)

(A) could be \(-1\)
(B) must be 0
(C) must be 1
(D) could be less than 1 and greater than \(-1\)
(E) must be less than \(-1\) or greater than 1

---

27 For what triples of real numbers \((a, b, c)\) with \(a \neq 0\) is the function defined by

\[
f(x) = \begin{cases} x, & \text{if } x \leq 1 \\ ax^2 + bx + c, & \text{if } x > 1 \end{cases}
\]

differentiable at all real \(x\)?

(A) \(((a, 1 - 2a, a) | a \) is a nonzero real number\)
(B) \(((a, 1 - 2a, c) | a, c \) are real numbers and \(a \neq 0\)\)
(C) \(((a, b, c) | a, b, c \) are real numbers, \(a \neq 0\), and \(a + b + c = 1\)\)
(D) \(\left\{\left(\frac{1}{2}, 0, 0\right)\right\}\)
(E) \(((a, 1 - 2a, 0) | a \) is a nonzero real number\)

---

GO ON TO THE NEXT PAGE
Questions 28-30 are based on the following information.

Let \( f \) be a function such that the graph of \( f \) is a semicircle \( S \) with end points \( (a, 0) \) and \( (b, 0) \) where \( a < b \).

28 \[ \int_{a}^{b} f(x) \, dx = \]

(A) \( f(b) - f(a) \)  
(B) \( \frac{f(b) - f(a)}{b - a} \)  
(C) \( (b - a) \frac{\pi}{4} \)  
(D) \( (b - a)^2 \pi \)  
(E) \( (b - a)^2 \frac{\pi}{8} \)

29 The graph of \( y = 3f(x) \) is a

(A) translation of \( S \)  
(B) semicircle with radius three times that of \( S \)  
(C) subset of an ellipse  
(D) subset of a parabola  
(E) subset of a hyperbola

30 The improper integral \[ \int_{a}^{b} f(x)f'(x) \, dx \] is

(A) necessarily zero  
(B) possibly zero but not necessarily  
(C) necessarily nonexistent  
(D) possibly nonexistent but not necessarily  
(E) none of the above

GO ON TO THE NEXT PAGE.
31. \( \lim_{x \to \pi} \frac{e^{-\pi} - e^{-x}}{\sin x} = \)

(A) \(-\infty\)  (B) \(-e^{-\pi}\)  (C) 0  (D) \(e^{-\pi}\)  (E) 1

32. The dimension of the subspace spanned by the real vectors

\[
\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 2 \\ 2 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 2 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix}
\]

is

(A) 2  (B) 3  (C) 4  (D) 5  (E) 6

33. The shaded region in the figure above indicates the graph of which of the following?

(A) \(x^2 < y\) and \(y < \frac{1}{x}\)  (B) \(x^2 < y\) or \(y < \frac{1}{x}\)  (C) \(x^2 > y\) and \(y > \frac{1}{x}\)

(D) \(x^2 > y\) or \(y > \frac{1}{x}\)  (E) \(x^2 < y\) and \(xy < 1\)

GO ON TO THE NEXT PAGE
34. Let the bottom edge of a rectangular mirror on a vertical wall be parallel to and \( h \) feet above the level floor. If a person with eyes \( t \) feet above the floor is standing erect at a distance \( d \) feet from the mirror, what is the relationship among \( h \), \( d \), and \( t \) if the person can just see his own feet in the mirror?

(A) \( t = 2h \) and \( d \) does not matter.  
(B) \( t = 4d \) and \( h \) does not matter.  
(C) \( h^2 + d^2 = \frac{t^2}{4} \)

(D) \( t - h = d \)  
(E) \( (t - h)^2 = 4d \)

35. The rank of the matrix

\[
\begin{pmatrix}
1 & 2 & 3 & 4 & 5 \\
6 & 7 & 8 & 9 & 10 \\
11 & 12 & 13 & 14 & 15 \\
16 & 17 & 18 & 19 & 20 \\
21 & 22 & 23 & 24 & 25
\end{pmatrix}
\]

is

(A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

36. The shortest distance from the curve \( xy = 8 \) to the origin is

(A) 4  
(B) 8  
(C) 16  
(D) \( 2\sqrt{2} \)  
(E) \( 4\sqrt{2} \)

GO ON TO THE NEXT PAGE
39. If \( f(x) = \begin{cases} \frac{|x|}{x}, & \text{for } x \neq 0 \\ 0, & \text{for } x = 0, \end{cases} \) then \( \int_{-1}^{1} f(x) \, dx \) is

(A) \(-2\) (B) \(0\) (C) \(2\) (D) not defined

(E) none of the above

40. Let \( y = f(x) \) be a solution of the differential equation \( x \, dy + (y - xe^{x}) \, dx = 0 \) such that \( y = 0 \) when \( x = 1 \). What is the value of \( f(2) \) ?

(A) \(\frac{1}{2e}\) (B) \(\frac{1}{e}\) (C) \(\frac{e^2}{2}\) (D) \(2e\) (E) \(2e^2\)

41. Of the following, which best represents a portion of the graph of \( y = \frac{1}{e^x} + x - \frac{1}{e} \) near \((1, 1)\) ?

(A) ![Graph A](image1)

(B) ![Graph B](image2)

(C) ![Graph C](image3)

(D) ![Graph D](image4)

(E) ![Graph E](image5)
39. If \( f(x) = \begin{cases} \frac{|x|}{x}, & \text{for } x \neq 0 \\ 0, & \text{for } x = 0, \end{cases} \) then \( \int_{-1}^{1} f(x) \, dx \) is

(A) \(-2\)  \hspace{1cm} (B) \(0\)  \hspace{1cm} (C) \(2\)  \hspace{1cm} (D) not defined

(E) none of the above

40. Let \( y = f(x) \) be a solution of the differential equation \( x \, dy + (y - xe^x) \, dx = 0 \) such that \( y = 0 \) when \( x = 1 \). What is the value of \( f(2) \)?

(A) \(\frac{1}{2e}\)  \hspace{1cm} (B) \(\frac{1}{e}\)  \hspace{1cm} (C) \(\frac{e^2}{2}\)  \hspace{1cm} (D) \(2e\)  \hspace{1cm} (E) \(2e^2\)

41. Of the following, which best represents a portion of the graph of \( y = \frac{1}{e^x} + x - \frac{1}{e} \) near \((1, 1)\)?

(A) \hspace{1cm} (B) \hspace{1cm} (C) \hspace{1cm} (D) \hspace{1cm} (E)
42. In $xy^2$-space, the degree measure of the angle between the rays $z = x \geq 0, \ y = 0$

and

$z = y \geq 0, \ x = 0$ is

(A) $0^\circ$ (B) $30^\circ$ (C) $45^\circ$ (D) $60^\circ$ (E) $90^\circ$

43. If a polynomial $f(x)$ over the real numbers has the complex numbers $2 + i$ and $1 - i$ as roots, then $f(x)$ could be

(A) $x^4 + 6x^3 + 10$ (B) $x^4 + 7x^2 + 10$ (C) $x^3 - x^2 + 4x + 1$

(D) $x^3 + 5x^2 + 4x + 1$ (E) $x^4 - 6x^3 + 15x^2 - 18x + 10$

44. Suppose $f$ is a real function such that $f'(x_0)$ exists. Which of the following is the value of $\lim_{h \to 0} \frac{f(x_0 + h) - f(x_0 - h)}{2h}$?

(A) $0$ (B) $2f'(x_0)$ (C) $f'(-x_0)$ (D) $-f'(x_0)$ (E) $-2f'(x_0)$

GO ON TO THE NEXT PAGE.
45. The radius of convergence of the series \( \sum_{n=0}^{\infty} \frac{e^n}{n!} x^n \) is

(A) 0  (B) \( \frac{1}{e} \)  (C) 1  (D) \( e \)  (E) \( +\infty \)

46. In the \( xy \)-plane, the graph of \( x^{\log y} = y^{\log x} \) is

(A) empty  (B) a single point  (C) a ray in the open first quadrant
(D) a closed curve  (E) the open first quadrant

47. Suppose that the space \( S \) contains exactly eight points. If \( \mathcal{B} \) is a collection of 250 distinct subsets of \( S \), which of the following statements must be true?

(A) \( S \) is an element of \( \mathcal{B} \).
(B) \( \cap G = S \) for some \( G \in \mathcal{B} \).
(C) \( \cap G \) is a nonempty proper subset of \( S \) for some \( G \in \mathcal{B} \).
(D) \( \mathcal{B} \) has a member that contains exactly one element.
(E) The empty set is an element of \( \mathcal{B} \).

GO ON TO THE NEXT PAGE
48. Let \( V \) be the set of all real polynomials \( p(x) \). Let transformations \( T, S \) be defined on \( V \) by
\[ T: p(x) \mapsto xp(x) \quad \text{and} \quad S: p(x) \mapsto p'(x) = \frac{d}{dx} p(x), \]
and interpret \((ST)(p(x))\) as \( S(T(p(x)))\).
Which of the following is true?

(A) \( ST = 0 \)
(B) \( ST = T \)
(C) \( ST = TS \)
(D) \( ST - TS \) is the identity map of \( V \) onto itself.
(E) \( ST + TS \) is the identity map of \( V \) onto itself.

49. If the finite group \( G \) contains a subgroup of order seven but no element (other than the identity) is its own inverse, then the order of \( G \) could be

(A) 27  (B) 28  (C) 35  (D) 37  (E) 42

50. In a game two players take turns tossing a fair coin; the winner is the first one to toss a head. The probability that the player who makes the first toss wins the game is

(A) \( \frac{1}{4} \)  (B) \( \frac{1}{3} \)  (C) \( \frac{1}{2} \)  (D) \( \frac{2}{3} \)  (E) \( \frac{3}{4} \)

51. Let \( x_1 = 1 \) and \( x_{n+1} = \sqrt{3 + 2x_n} \) for all positive integers \( n \). If it is assumed that \( \{x_n\} \) converges, then \( \lim_{n \to \infty} x_n = \)

(A) \(-1\)  (B) 0  (C) \( \sqrt{5} \)  (D) \( e \)  (E) 3

GO ON TO THE NEXT PAGE.
56. The polynomial \( p(x) = 1 + \frac{1}{2}(x - 1) - \frac{1}{8}(x - 1)^2 \) is used to approximate \( \sqrt{1.01} \). Which of the following most closely approximates the error \( \sqrt{1.01} - p(1.01) \)?

(A) \( \left( \frac{1}{16} \right) \times 10^{-6} \)  
(B) \( \left( \frac{1}{48} \right) \times 10^{-8} \)  
(C) \( \left( \frac{3}{8} \right) \times 10^{-10} \)  
(D) \( -\left( \frac{3}{8} \right) \times 10^{-10} \)  
(E) \( -\left( \frac{1}{16} \right) \times 10^{-6} \)

57. Acceptable input for a certain pocket calculator is a finite sequence of characters each of which is either a digit or a sign. The first character must be a digit, the last character must be a digit, and any character that is a sign must be followed by a digit. There are 10 possible digits and 4 possible signs. If \( N_k \) denotes the number of such acceptable sequences having length \( k \), then \( N_k \) is given recursively by

(A) \( N_1 = 10 \)  
\( N_k = 10N_{k-1} \)  

(B) \( N_1 = 10 \)  
\( N_k = 14N_{k-1} \)  

(C) \( N_1 = 10 \)  
\( N_2 = 100 \)  
\( N_k = 10N_{k-1} + 40N_{k-2} \)  

(D) \( N_1 = 10 \)  
\( N_2 = 140 \)  
\( N_k = 14N_{k-1} + 40N_{k-2} \)  

(E) \( N_1 = 14 \)  
\( N_2 = 196 \)  
\( N_k = 10N_{k-1} + 14N_{k-2} \)  

GO ON TO THE NEXT PAGE
58. If \( f(z) \) is an analytic function that maps the entire finite complex plane into the real axis, then the imaginary axis must be mapped onto

(A) the entire real axis  
(B) a point  
(C) a ray  
(D) an open finite interval  
(E) the empty set

59. If \( f \) is the function whose graph is indicated in the figure above, then the least upper bound (supremum) of

\[
\left\{ \sum_{k=1}^{n} |f(x_k) - f(x_{k-1})| : 0 = x_0 < x_1 < \ldots < x_{n-1} < x_n = 12 \right\}
\]

appears to be

(A) 2  
(B) 7  
(C) 12  
(D) 16  
(E) 21

60. A fair die is tossed 360 times. The probability that a six comes up on 70 or more of the tosses is

(A) greater than 0.50  
(B) between 0.16 and 0.50  
(C) between 0.02 and 0.16  
(D) between 0.01 and 0.02  
(E) less than 0.01

GO ON TO THE NEXT PAGE
61. Let $I \neq A \neq -I$, where $I$ is the identity matrix and $A$ is a real $2 \times 2$ matrix. If $A = A^{-1}$, then the trace of $A$ is

(A) 2  (B) 1  (C) 0  (D) -1  (E) -2

---

62. If $B$ is the boundary of $S$ as indicated in the figure above, then $\int_B (3ydx + 4xdy) =$

(A) 0  (B) 1  (C) 3  (D) 4  (E) 7

---

63. Let $f$ be a continuous, strictly decreasing, real-valued function such that $\int_0^{+\infty} f(x) \, dx$ is finite and $f(0) = 1$.

In terms of $f^{-1}$ (the inverse function of $f$), $\int_0^{+\infty} f(x) \, dx$ is

(A) less than $\int_0^{+\infty} f^{-1} (y) \, dy$  (B) greater than $\int_0^{+\infty} f^{-1} (y) \, dy$  (C) equal to $\int_0^{+\infty} f^{-1} (y) \, dy$

(D) equal to $\int_0^1 f^{-1} (y) \, dy$  (E) equal to $\int_0^{+\infty} f^{-1} (y) \, dy$

---

GO ON TO THE NEXT PAGE.
WORK SHEET for the MATHEMATICS Test, Form GR8767 ONLY
Answer Key and Percentage* of Examinees Answering Each Question Correctly

<table>
<thead>
<tr>
<th>QUESTION Number</th>
<th>Answer</th>
<th>P+</th>
<th>TOTAL</th>
<th>C</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>92</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td>72</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>89</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>89</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>89</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>83</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A</td>
<td>81</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>E</td>
<td>76</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>E</td>
<td>84</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>C</td>
<td>79</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>B</td>
<td>77</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B</td>
<td>81</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>D</td>
<td>82</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>A</td>
<td>47</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>E</td>
<td>77</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>B</td>
<td>61</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>C</td>
<td>49</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>D</td>
<td>65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>D</td>
<td>71</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>C</td>
<td>42</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>A</td>
<td>54</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>B</td>
<td>54</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>C</td>
<td>56</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>D</td>
<td>50</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>D</td>
<td>50</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>E</td>
<td>54</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>A</td>
<td>34</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>E</td>
<td>78</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>C</td>
<td>58</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>A</td>
<td>29</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>B</td>
<td>58</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>B</td>
<td>62</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>E</td>
<td>41</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>A</td>
<td>51</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>B</td>
<td>29</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>A</td>
<td>54</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>D</td>
<td>38</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>A</td>
<td>99</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>B</td>
<td>99</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>C</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUESTION Number</th>
<th>Answer</th>
<th>P+</th>
<th>TOTAL</th>
<th>C</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>D</td>
<td>47</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>D</td>
<td>33</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>E</td>
<td>49</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>B</td>
<td>57</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>E</td>
<td>46</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>E</td>
<td>42</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>D</td>
<td>48</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>D</td>
<td>67</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>C</td>
<td>41</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>D</td>
<td>40</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>E</td>
<td>52</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>C</td>
<td>59</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>B</td>
<td>23</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>E</td>
<td>39</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>C</td>
<td>16</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>A</td>
<td>31</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>C</td>
<td>46</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>B</td>
<td>37</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>D</td>
<td>35</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>C</td>
<td>23</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>C</td>
<td>37</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>B</td>
<td>33</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>D</td>
<td>40</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>C</td>
<td>39</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>A</td>
<td>48</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>B</td>
<td>57</td>
<td>57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correct (C)
Incorrect (I)

Total Score
C − I/4 = __________

Scaled Score (SS) = __________

*Estimated P+ for the group of examinees who took the GRE Mathematics Test in a recent three-year period