

# GRE Mathematics Practice Test 92

## Advanced Practice

English edition / 66 multiple-choice questions

66

Questions

170

Minutes

A–E

One correct choice

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### Instructions

Choose exactly one answer for each question. Do not use a calculator. Begin timing at Question 1. Use the space provided or separate scratch paper. The answer key follows Question 66; no solutions are included.

Angles are measured in radians. Unless specified otherwise, logarithms are natural,  $\mathbb{N} = \{1, 2, 3, \dots\}$ , and distances in  $\mathbb{R}^n$  are Euclidean.  $I_n$  denotes the  $n \times n$  identity matrix. Graphs are finite and simple unless stated otherwise.

### Difficulty target

A demanding practice form with frequent multi-step arguments and a mix of computational and conceptual questions. This is cycle 18 of 19, position 2 of 5; difficulty decreases within each cycle.

Difficulty labels are editorial targets, not ETS-equated ratings. No official scaled-score conversion is provided.

### Coverage

|                 |                                                                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------|
| Calculus / 33   | Differential and integral calculus, sequences and series, several variables, vector calculus, and differential equations. |
| Algebra / 17    | Elementary and linear algebra, groups, rings, fields, and number theory.                                                  |
| Additional / 16 | Probability, statistics, analysis, topology, complex variables, discrete mathematics, and numerical methods.              |

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This series uses independently written question families and parameter variants. Related mathematical structures recur across forms; these are training forms, not 95 psychometrically independent official exams.

Scope reference: ETS, *GRE Mathematics Test Practice Book*, ETS official practice-book PDF. Questions are not taken from that book. This booklet is not published or endorsed by ETS.

**Questions 1–3**

1. Evaluate  $\int_0^{\log 2} e^x(e^x + 19)^5 dx$ .

- (A)  $\frac{21^6}{6}$
- (B)  $21^5 - 20^5$
- (C)  $-\frac{21^6 - 20^6}{6}$
- (D)  $\frac{21^6 - 20^6}{6}$
- (E)  $6 \left( \frac{21^6 - 20^6}{6} \right)$

2. A  $3 \times 3$  matrix  $A$  has characteristic polynomial  $(t - 88)(t + 1)(t - 2)$ . What is  $\text{tr}(A^3 - 2A + I)$ ?

- (A) 681305
- (B) 681306
- (C) 681304
- (D) 681303
- (E) 681302

3. Find the curvature of the helix  $r(t) = (19 \cos t, 19 \sin t, 5t)$ .

- (A)  $\frac{405}{386}$
- (B)  $\frac{19}{386}$
- (C)  $\frac{19}{772}$
- (D)  $-\frac{19}{386}$
- (E)  $\frac{19}{193}$

**Questions 4–6**

4. Let  $X_1, \dots, X_{39}$  be independent uniform random variables on  $[0, 1]$ . What is  $E[(\max_i X_i)^2]$ ?
- (A)  $\frac{39}{41}$   
(B)  $\frac{2}{41}$   
(C)  $\frac{40}{41}$   
(D)  $\frac{13}{41}$   
(E)  $\frac{39}{82}$
5. Find the coefficient of  $x^5$  in the Taylor series of  $(1 - 19x)^{-2}$  at zero.
- (A)  $6 \cdot 19^5$   
(B)  $\frac{1}{19} (6 \cdot 19^5)$   
(C)  $\frac{1}{6} (6 \cdot 19^5)$   
(D)  $-6 \cdot 19^5$   
(E)  $\frac{5}{6} (6 \cdot 19^5)$
6. Let  $N$  be the  $94 \times 94$  matrix with ones immediately above the diagonal and zeros elsewhere. Find  $\dim(\ker N^{32} / \ker N^{16})$ .
- (A) 18  
(B) 17  
(C) 14  
(D) 16  
(E) 15

## Questions 7–9

7. For  $D = \{(x, y) : x^2 + y^2 \leq 19\}$ , evaluate  $\iint_D (x^2 + y^2)^4 dA$ .
- (A)  $\frac{2476099\pi}{9}$   
(B)  $2476099\pi$   
(C)  $\frac{130321\pi}{5}$   
(D)  $\frac{2476099\pi}{5}$   
(E)  $\frac{4952198\pi}{5}$
8. Independent trials have success probability  $1/39$ . Let  $T$  count trials up to and including the first success. Find  $E[T^2]$ .
- (A) 1001  
(B) 2002  
(C) 3003  
(D) 5005  
(E) 4004
9. Let  $C$  be the unit circle  $x^2 + y^2 = 1$ ,  $z = 5$ , counterclockwise viewed from above. Evaluate  $\int_C -19y(x^2 + y^2)^4 dx + (19x(x^2 + y^2)^4) dy + 3z dz$ .
- (A)  $-38\pi$   
(B)  $76\pi$   
(C)  $38\pi$   
(D)  $19\pi$   
(E)  $1 + 38\pi$

**Questions 10–12**

**10.** Let  $A$  be the  $94 \times 94$  matrix whose diagonal entries are 91 and whose off-diagonal entries are 1. What is its largest eigenvalue?

- (A) 183
- (B) 185
- (C) 186
- (D) 184
- (E) 182

**11.** Find the arc length of  $r(t) = (19(t - t^3/3), 19t^2)$  for  $0 \leq t \leq 1/5$ .

- (A)  $-\frac{1444}{375}$
- (B)  $\frac{722}{375}$
- (C)  $\frac{1444}{375}$
- (D)  $\frac{1819}{375}$
- (E)  $\frac{2888}{375}$

**12.** A uniformly random subset of 39 objects is selected from a collection with 40 red and 41 blue objects. If  $X$  is the number of red objects selected, find  $E[X]$ .

- (A)  $\frac{260}{27}$
- (B)  $\frac{520}{27}$
- (C)  $\frac{574}{27}$
- (D)  $\frac{547}{27}$
- (E)  $\frac{1040}{27}$

**Questions 13–15**

**13.** Evaluate  $\iiint_B 19z^2(x^2 + y^2 + z^2)^5 dV$ , where  $B$  is the unit ball.

- (A)  $\frac{76\pi}{45}$
- (B)  $\frac{152\pi}{45}$
- (C)  $-\frac{76\pi}{45}$
- (D)  $1 + \frac{76\pi}{45}$
- (E)  $\frac{38\pi}{45}$

**14.** Positive real numbers  $x, y$  satisfy  $\log_2 x + \log_2 y = \log_2 968$  and  $x + y = 99$ . Find  $x^2 + y^2$ .

- (A) 7866
- (B) 7867
- (C) 7865
- (D) 7864
- (E) 7863

**15.** Let  $F(x) = \int_0^x (x - t)^4 e^{19t} dt$ . Find  $F^{(5)}(0)$ .

- (A)  $\frac{1}{24}$
- (B) 24
- (C) 120
- (D) 0
- (E) 456

**Questions 16–18**

**16.**  $X, Y$  are independent Poisson variables with means 39 and 40. Given  $X + Y = 41$ , find  $\text{Var}(X \mid X + Y)$ .

- (A)  $\frac{127920}{6241}$
- (B)  $\frac{31980}{6241}$
- (C)  $\frac{70201}{6241}$
- (D)  $\frac{63960}{6241}$
- (E)  $\frac{76442}{6241}$

**17.** Under  $x = u + 19v$ ,  $y = u - 5v$ , what is the area of the image of  $0 \leq u, v \leq 1$ ?

- (A)  $\frac{1}{24}$
- (B) 95
- (C) 14
- (D) 576
- (E) 24

**18.** A sequence satisfies  $u_0 = 88$  and  $u_{k+1} = 2u_k + 11$  for all  $k \geq 0$ . Find  $u_8$ .

- (A) 25333
- (B) 25334
- (C) 25335
- (D) 25332
- (E) 25331

## Questions 19–21

19. Two solutions of  $y'' + 19x^5y' + 5y = 0$  have Wronskian  $W(0) = 1$ . Find  $W(1)$ .

- (A)  $e^{-\frac{19}{6}} + 1$
- (B)  $\frac{2}{e^{\frac{19}{6}}}$
- (C)  $\frac{1}{2e^{\frac{19}{6}}}$
- (D)  $-\frac{1}{e^{\frac{19}{6}}}$
- (E)  $e^{-\frac{19}{6}}$

20.  $X, Y$  are independent, with variances 39 and 40. Find  $\text{Cov}(X + 2Y, 3X - Y)$ .

- (A) 25
- (B) 49
- (C) 61
- (D) 13
- (E) 37

21. What is the radius of convergence about zero of  $\sum_{j=1}^{\infty} \frac{(19j)!}{(j!)^{19}} x^{5j}$ ?

- (A)  $19^{-\frac{19}{5}}$
- (B)  $19^{-\frac{5}{19}}$
- (C)  $19^{-19}$
- (D)  $19^{\frac{19}{5}}$
- (E)  $\frac{1}{19}$

## Questions 22–24

**22.** Linear maps  $T : \mathbb{R}^{95} \rightarrow \mathbb{R}^{95}$  and  $U : \mathbb{R}^{95} \rightarrow \mathbb{R}^{95}$  have ranks 4 and 4. What is the largest possible rank of  $UT$ ?

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

**23.** Let  $f(x) = \log(1 + 19x)$ . Find  $f^{(5)}(0)$ .

- (A)  $-(-1)^4 4! 19^5$
- (B)  $\frac{1}{19} \left( (-1)^4 4! 19^5 \right)$
- (C)  $\frac{1}{5} \left( (-1)^4 4! 19^5 \right)$
- (D)  $5 \left( (-1)^4 4! 19^5 \right)$
- (E)  $(-1)^4 4! 19^5$

**24.** A continuous  $f : \mathbb{R} \rightarrow \mathbb{R}$  satisfies  $f(q) = q^{29}$  for every rational  $q$ . Find  $f(2)$ .

- (A)  $2^{28}$
- (B)  $2^{31}$
- (C)  $2^{29}$
- (D)  $2^{32}$
- (E)  $2^{30}$

## Questions 25–27

25. For  $\mathbf{F} = (19x^5y, y^5z, xz^5)$ , find  $\nabla \cdot \mathbf{F}$  at  $(1, 2, 1)$ .

- (A)  $-275$
- (B)  $276$
- (C)  $275$
- (D)  $550$
- (E)  $\frac{275}{2}$

26. Fix a nonzero vector  $u \in \mathbb{R}^{94}$ . What is the dimension of the space of skew-symmetric  $94 \times 94$  matrices  $A$  satisfying  $Au = 0$ ?

- (A) 4276
- (B) 4277
- (C) 4278
- (D) 4280
- (E) 4279

27. The local inverse  $y(x)$  of  $x = 19y + y^3$  satisfies  $y(0) = 0$ . Find  $y^{(5)}(0)$ .

- (A)  $\frac{1}{19} \left( \frac{360}{19^7} \right)$
- (B)  $\frac{1}{120} \left( \frac{360}{19^7} \right)$
- (C)  $19 \left( \frac{360}{19^7} \right)$
- (D)  $\frac{360}{19^7}$
- (E)  $-\frac{360}{19^7}$

## Questions 28–30

28. Find the radius of convergence of  $\sum_{k \geq 1} k^2 z^{2k} / 29^{2k} + \sum_{k \geq 0} z^{2k+1} / (30)^{2k+1}$ .

- (A) 38
- (B) 29
- (C) 11
- (D) 47
- (E) 20

29. Evaluate  $\int_0^{\pi/2} \sin^{11} t \cos^{39} t \, dt$ .

- (A)  $25 \left( \frac{5! 19!}{2 \cdot 25!} \right)$
- (B)  $\frac{5! 19!}{2 \cdot 25!}$
- (C)  $42504 \left( \frac{5! 19!}{2 \cdot 25!} \right)$
- (D)  $\frac{1}{2} \left( \frac{5! 19!}{2 \cdot 25!} \right)$
- (E)  $2 \left( \frac{5! 19!}{2 \cdot 25!} \right)$

30. Let  $A = \begin{bmatrix} 1 & 88 & 0 \\ 0 & 1 & 11 \\ 0 & 0 & 1 \end{bmatrix}$ . What is the  $(1,3)$  entry of  $A^6$ ?

- (A) 14518
- (B) 14519
- (C) 14521
- (D) 14522
- (E) 14520

## Questions 31–33

31. For  $T = \{x, y, z \geq 0 : x + y + z \leq 1\}$ , evaluate  $\iiint_T x^{19} y^4 dV$ .

- (A)  $\frac{1}{100}$
- (B)  $26 \left( \frac{19! 4!}{26!} \right)$
- (C)  $\frac{19! 4!}{26!}$
- (D)  $6 \left( \frac{19! 4!}{26!} \right)$
- (E)  $\frac{1}{6} \left( \frac{19! 4!}{26!} \right)$

32. On  $[0, 1]$ ,  $f$  is 29 on rationals and  $1/29$  on irrationals. Find its upper Darboux integral minus its lower Darboux integral.

- (A)  $\frac{869}{29}$
- (B)  $\frac{420}{29}$
- (C)  $\frac{1680}{29}$
- (D)  $\frac{898}{29}$
- (E)  $\frac{840}{29}$

33. Evaluate  $\int_0^\infty x^5 e^{-19x} dx$ .

- (A)  $19 \left( \frac{5!}{19^6} \right)$
- (B)  $\frac{1}{5} \left( \frac{5!}{19^6} \right)$
- (C)  $\frac{5!}{19^6}$
- (D)  $\frac{1}{19} \left( \frac{5!}{19^6} \right)$
- (E) 120

## Questions 34–36

**34.** An invertible  $94 \times 94$  matrix  $A$  has determinant 4. Find  $\det(\text{adj } A)$ .

- (A)  $2^{187}$
- (B)  $2^{186}$
- (C)  $2^{186} \cdot 5$
- (D)  $2^{186} \cdot 3$
- (E)  $2^{185}$

**35.** Evaluate  $\sum_{j=0}^{\infty} \frac{1}{(19 + 5j)(24 + 5j)}$ .

- (A)  $\frac{1}{24}$
- (B)  $\frac{1}{95}$
- (C)  $\frac{1}{5}$
- (D)  $\frac{1}{19}$
- (E)  $\frac{5}{19}$

**36.** A set with 29 elements has the discrete topology. How many of its subsets are simultaneously open and closed?

- (A)  $2^{29}$
- (B)  $2^{28}$
- (C)  $2^{30}$
- (D)  $2^{32}$
- (E)  $2^{31}$

## Questions 37–39

37. For the curve  $x = t^5$ ,  $y = t^6 + 19t$ , find  $d^2y/dx^2$  at  $t = 1$ .

- (A)  $-14$
- (B)  $5$
- (C)  $-\frac{19}{5}$
- (D)  $\frac{82}{25}$
- (E)  $-\frac{14}{5}$

38. On  $P_{95}$ , the real polynomials of degree at most 95, define  $T(p) = x^2p'' - 32xp' + 272p$ . Find its rank.

- (A) 94
- (B) 93
- (C) 92
- (D) 95
- (E) 96

39. For  $f(x, y) = x^2 + 19xy + 5y^2$ , what is its maximum directional derivative at  $(1, -1)$ ?

- (A) 370
- (B)  $-17$
- (C) 26
- (D)  $\sqrt{370}$
- (E) 9

## Questions 40–42

40. How many zeros, counted with multiplicity, does  $z^{24} + 27z + 1$  have in  $|z| < 1$ ?

- (A) 3
- (B) 4
- (C) 0
- (D) 2
- (E) 1

41. Evaluate  $\int_0^1 x^{19}(1-x)^4 dx$ .

- (A)  $24 \left( \frac{19! 4!}{24!} \right)$
- (B)  $20 \left( \frac{19! 4!}{24!} \right)$
- (C)  $\frac{10626}{5} \left( \frac{19! 4!}{24!} \right)$
- (D)  $\frac{19! 4!}{24!}$
- (E)  $\frac{1}{5} \left( \frac{19! 4!}{24!} \right)$

42. The symmetric group  $S_{94}$  acts on the two-element subsets of  $\{1, \dots, 94\}$ . What is the index of the setwise stabilizer of  $\{1, 2\}$ ?

- (A) 4369
- (B) 4370
- (C) 4373
- (D) 4372
- (E) 4371

## Questions 43–45

43. The solution of  $y' = 19x^4y^2$ ,  $y(0) = 1$ , has its first positive singularity at which  $x$ ?
- (A)  $\frac{19^{\frac{4}{5}}}{19}$   
(B)  $\frac{5}{19}$   
(C)  $\frac{38^{\frac{4}{5}}\sqrt[5]{5}}{38}$   
(D)  $\frac{\sqrt[5]{19} \cdot 5^{\frac{4}{5}}}{5}$   
(E)  $\frac{19^{\frac{4}{5}}\sqrt[5]{5}}{19}$
44. A meromorphic function has 26 zeros and 2 poles inside a positively oriented simple closed contour, counted with multiplicity, and no zeros or poles on it. Find  $\frac{1}{2\pi i} \int f'(z)/f(z) dz$ .
- (A) 16  
(B) 40  
(C) 32  
(D) 24  
(E) 8
45. Evaluate  $\lim_{x \rightarrow 0} \frac{\sin(19x) - \sum_{j=0}^3 (-1)^j (19x)^{2j+1} / (2j+1)!}{x^9}$ .
- (A)  $\frac{(-1)^4 19^9}{9!}$   
(B)  $\frac{1}{19} \left( \frac{(-1)^4 19^9}{9!} \right)$   
(C)  $9 \left( \frac{(-1)^4 19^9}{9!} \right)$   
(D)  $19 \left( \frac{(-1)^4 19^9}{9!} \right)$   
(E)  $-\frac{(-1)^4 19^9}{9!}$

**Questions 46–48**

- 46.** In  $\mathbb{Z}/2922\mathbb{Z}$ , how many residues are not idempotent ( $x^2 \neq x$ )?
- (A) 2914
  - (B) 2912
  - (C) 2915
  - (D) 2916
  - (E) 2913
- 47.** If  $f(x, y) = \log(x^2 + y^2)$ ,  $x = e^{19t} \cos(5t)$ , and  $y = e^{19t} \sin(5t)$ , find  $d^2f/dt^2$  at  $t = 1$ .
- (A) 10
  - (B) 772
  - (C) 0
  - (D) 1444
  - (E) 38
- 48.** How many nonnegative integer triples sum to 78, if each coordinate is at most 39?
- (A) 1366
  - (B) 1093
  - (C) 274
  - (D) 820
  - (E) 547

## Questions 49–51

49. If  $y'' - 38y' + 361y = 5e^{19x}$  and  $y(0) = y'(0) = 0$ , find  $y(1)$ .

- (A)  $5e^{19}$
- (B)  $\frac{5e^{19}}{2}$
- (C)  $\frac{5e^{19}}{4}$
- (D)  $1 + \frac{5e^{19}}{2}$
- (E)  $-\frac{5e^{19}}{2}$

50. In the additive group  $\mathbb{Z}/114\mathbb{Z}$ , find the index of the subgroup generated by  $[3]$ .

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

51. Near  $(0, 0)$ ,  $z = z(x, y)$  satisfies  $z + 19z^2 = x + 5y$  and  $z(0, 0) = 0$ . Find  $z_{xy}(0, 0)$ .

- (A)  $-38$
- (B)  $-190$
- (C)  $-95$
- (D)  $-5$
- (E)  $190$

## Questions 52–54

52. A tree has 39 vertices of degree 3; every other vertex has degree 1. How many leaves does it have?

- (A) 15
- (B) 54
- (C) 41
- (D) 67
- (E) 28

53. Evaluate  $\int_0^1 x^{18}(\log x)^4 dx$ .

- (A)  $\frac{1}{19}$
- (B)  $-\frac{(-1)^4 4!}{19^5}$
- (C)  $\frac{1}{5} \left( \frac{(-1)^4 4!}{19^5} \right)$
- (D)  $19 \left( \frac{(-1)^4 4!}{19^5} \right)$
- (E)  $\frac{(-1)^4 4!}{19^5}$

54. How many invertible  $3 \times 3$  matrices over  $\mathbb{F}_{61}$  are there with determinant 1?

- (A)  $\frac{(61^3 - 61^0)(61^3 - 61^0)(61^3 - 61^0)}{60}$
- (B)  $\frac{(61^3 - 61^0)(61^3 - 61^1)(61^3 - 61^2)}{60}$
- (C)  $\frac{61^3 61^3 61^3}{60}$
- (D)  $\frac{(61^3 - 61^1)(61^3 - 61^2)(61^3 - 61^3)}{60}$
- (E)  $\frac{(61^3 - 61^0)(61^3 - 61^1)}{60}$

## Questions 55–57

55. Find the coefficient of  $x^4$  in  $e^{4x} \log(1 + 19x)$ .

- (A)  $-\frac{98705}{4}$
- (B)  $-\frac{130321}{4}$
- (C)  $\frac{98705}{4}$
- (D)  $-592230$
- (E)  $-\frac{98629}{4}$

56. A connected planar graph has 42 vertices and 79 edges. How many faces, including the unbounded face, are in a planar embedding?

- (A) 52
- (B) 13
- (C) 26
- (D) 39
- (E) 65

57. A lamina occupies  $0 \leq x \leq 1$ ,  $0 \leq y \leq 19x$  and has density  $\rho(x, y) = x^3y$ . Find its centroid coordinate  $\bar{x}$ .

- (A)  $\frac{6}{7}$
- (B)  $-\frac{6}{7}$
- (C)  $\frac{3}{7}$
- (D)  $\frac{13}{7}$
- (E)  $\frac{12}{7}$

**Questions 58–60**

**58.** How many permutations in  $S_{94}$  consist of one 6-cycle and 88 fixed points?

- (A)  $2^3 \cdot 3^2 \cdot 5 \cdot 7 \cdot 13 \cdot 23 \cdot 31 \cdot 47 \cdot 89$
- (B)  $2^2 \cdot 3^2 \cdot 5 \cdot 7 \cdot 13 \cdot 23 \cdot 31 \cdot 47 \cdot 89$
- (C)  $2^3 \cdot 3^2 \cdot 5^2 \cdot 7 \cdot 13 \cdot 23 \cdot 31 \cdot 47 \cdot 89$
- (D)  $2^3 \cdot 3^3 \cdot 5 \cdot 7 \cdot 13 \cdot 23 \cdot 31 \cdot 47 \cdot 89$
- (E)  $2^4 \cdot 3^2 \cdot 5 \cdot 7 \cdot 13 \cdot 23 \cdot 31 \cdot 47 \cdot 89$

**59.** If  $y' = y(1 - y/5)$  and  $y(0) = 5/2$ , find  $y(-\log 19)$ .

- (A)  $-\frac{1}{4}$
- (B)  $\frac{1}{4}$
- (C)  $\frac{1}{2}$
- (D)  $\frac{5}{4}$
- (E)  $\frac{1}{8}$

**60.** How many integers in  $\{1, \dots, 234\}$  are divisible by 2 or 3?

- (A) 104
- (B) 52
- (C) 156
- (D) 260
- (E) 208

## Questions 61–63

61. If  $y'' + 25y = 19$  and  $y(0) = y'(0) = 0$ , find  $y(\pi/5)$ .

- (A)  $\frac{19}{25}$
- (B)  $\frac{63}{25}$
- (C)  $-\frac{38}{25}$
- (D)  $\frac{76}{25}$
- (E)  $\frac{38}{25}$

62. How many maximal proper subgroups does the cyclic group of order 1104 have?

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

63. For  $x > 0$ ,  $x^2y'' + (-42)xy' + 456y = 0$ ,  $y(1) = 0$ ,  $y'(1) = 1$ . Find  $y(e)$ .

- (A)  $-\frac{e^{19}}{5} + 1 + \frac{e^{24}}{5}$
- (B)  $-\frac{2(1 - e^5)e^{19}}{5}$
- (C)  $\frac{(1 - e^5)e^{19}}{5}$
- (D)  $-\frac{(1 - e^5)e^{19}}{5}$
- (E)  $-\frac{(1 - e^5)e^{19}}{10}$

**Questions 64–66**

**64.** Let  $F_0 = 0$ ,  $F_1 = 1$ , and  $F_{k+2} = F_{k+1} + F_k$ . How many binary strings of length 39 have no adjacent 1s?

- (A)  $F_{40}$
- (B)  $F_{43}$
- (C)  $F_{42}$
- (D)  $F_{41}$
- (E)  $F_{39}$

**65.** Evaluate  $\int_0^1 \int_0^x x^{19} y^5 dy dx$ .

- (A)  $\frac{1}{156}$
- (B)  $\frac{1}{182}$
- (C)  $\frac{1}{150}$
- (D)  $\frac{1}{120}$
- (E)  $\frac{1}{26}$

**66.** How many residues  $x$  modulo 114 satisfy  $7x \equiv 35 \pmod{114}$  and  $2x \equiv 0 \pmod{114}$ ?

- (A) 1
- (B) 0
- (C) 2
- (D) 3
- (E) 4

# Answer Key

Practice Test 92 / Questions 1–66

| Question | Answer | Question | Answer | Question | Answer |
|----------|--------|----------|--------|----------|--------|
| 1        | D      | 23       | E      | 45       | A      |
| 2        | C      | 24       | C      | 46       | A      |
| 3        | B      | 25       | C      | 47       | C      |
| 4        | A      | 26       | C      | 48       | D      |
| 5        | A      | 27       | D      | 49       | B      |
| 6        | D      | 28       | B      | 50       | E      |
| 7        | D      | 29       | B      | 51       | B      |
| 8        | C      | 30       | E      | 52       | C      |
| 9        | C      | 31       | C      | 53       | E      |
| 10       | D      | 32       | E      | 54       | B      |
| 11       | C      | 33       | C      | 55       | A      |
| 12       | B      | 34       | B      | 56       | D      |
| 13       | A      | 35       | B      | 57       | A      |
| 14       | C      | 36       | A      | 58       | A      |
| 15       | B      | 37       | E      | 59       | B      |
| 16       | D      | 38       | A      | 60       | C      |
| 17       | E      | 39       | D      | 61       | E      |
| 18       | A      | 40       | E      | 62       | C      |
| 19       | E      | 41       | D      | 63       | D      |
| 20       | E      | 42       | E      | 64       | D      |
| 21       | A      | 43       | E      | 65       | A      |
| 22       | B      | 44       | D      | 66       | B      |

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