CUET UG 2027 Mock Test 3: Mathematics

Full-length practice test in the CUET (UG) pattern, with answer key and solutions.

Test	Mathematics
Questions	50, all compulsory (multiple choice)
Duration	60 minutes
Marking	+5 for a correct answer, −1 for a wrong answer, 0 if not attempted
Maximum marks	250
Pattern basis	CUET (UG) 2026 Information Bulletin. NTA will confirm the 2027 pattern in its 2027 bulletin.
Note	Original mock test written by PreviousYearPaper.online. It is NOT an NTA previous year question paper.

Independent study resource by PreviousYearPaper.online, a part of Future Master Private Limited. Not affiliated with or endorsed by the National Testing Agency (NTA). Verify official information at cuet.nta.nic.in.

Mathematics

Q1. If A is the 2 × 2 matrix with rows (1, 2) and (3, 4), then |A| is
(A) 10 (B) −10
(C) −2 (D) 2

Q2. If A is a 3 × 3 matrix with |A| = 5, then |adj A| is
(A) 25 (B) 125
(C) 15 (D) 5

Q3. The inverse of the diagonal matrix with entries 2 and 4 is the diagonal matrix with entries
(A) 4 and 2 (B) 1/2 and 1/4
(C) −2 and −4 (D) 2 and 4

Q4. For matrices A and B, $(AB)^T$ equals
(A) AB (B) BA
(C) A^TB^T (D) B^TA^T

Q5. The principal value of $\sin^{-1}(1/2)$ is
(A) 5π/6 (B) π/3
(C) π/4 (D) π/6

Q6. The principal value of $\cos^{-1}(-1)$ is
(A) 0 (B) π
(C) −π (D) π/2

Q7. The relation R = {(1, 1), (2, 2), (3, 3)} on {1, 2, 3} is
(A) not transitive (B) not reflexive
(C) not symmetric (D) an equivalence relation

Q8. The inverse of f(x) = 2x + 3 is
(A) (x − 3)/2 (B) (x + 3)/2
(C) 1/(2x + 3) (D) 2x − 3

Q9. d/dx (e^{3x}) equals
(A) $3e^{3x}$ (B) e^{3x}
(C) $3xe^{3x-1}$ (D) $e^{3x}/3$

Q10. The derivative of log x at x = 2 is
(A) 1/2 (B) 2
(C) log 2 (D) 1

Q11. d/dx (sin x cos x) equals
(A) −sin 2x (B) sin 2x
(C) cos 2x (D) 2 cos x

Q12. The minimum value of $x^2 - 4x + 5$ is
(A) 0 (B) 2
(C) 1 (D) 5

Q13. A circle's radius grows at 2 cm/s. When r = 5 cm, its area grows at
(A) 20π cm^2/s (B) 4π cm^2/s
(C) 50π cm^2/s (D) 10π cm^2/s

Q14. $f(x) = x^3$ is increasing on

(A) no interval (B) $(-\infty, 0)$ only
(C) all real numbers (D) $(0, \infty)$ only

Q15. $\int 2x\,dx$ equals

(A) $x + C$ (B) $2 + C$
(C) $x^2 + C$ (D) $2x^2 + C$

Q16. $\int \cos x\,dx$ equals

(A) $\cos x + C$ (B) $\sin x + C$
(C) $-\sin x + C$ (D) $-\cos x + C$

Q17. $\int_0^1 x^2\,dx$ equals

(A) 1/2 (B) 1/3
(C) 2/3 (D) 1

Q18. $\int (1/x)\,dx$ equals

(A) $x^{-2} + C$ (B) $1/x^2 + C$
(C) $\log|x| + C$ (D) $x + C$

Q19. $\int_0^{\pi} \sin x\,dx$ equals

(A) 1 (B) π
(C) 0 (D) 2

Q20. The area under $y = x$ from $x = 0$ to $x = 2$ is

(A) 2 square units (B) 4 square units
(C) 1 square unit (D) 8 square units

Q21. The order of the differential equation $y'' + y' = 0$ is

(A) 0 (B) 3
(C) 2 (D) 1

Q22. The general solution of $dy/dx = 2x$ is

(A) $y = x^2 + C$ (B) $y = 2x^2 + C$
(C) $y = x + C$ (D) $y = 2x + C$

Q23. The general solution of $dy/dx = y$ is

(A) $y = C/x$ (B) $y = Ce^x$
(C) $y = x + C$ (D) $y = Cx$

Q24. $|2\hat{i} + 3\hat{j} + 6\hat{k}|$ equals

(A) $\sqrt{11}$ (B) 49
(C) 7 (D) 11

Q25. If $\vec{a} = \hat{i} + 2\hat{j}$ and $\vec{b} = 3\hat{i} - \hat{j}$, then $\vec{a} \cdot \vec{b}$ is

(A) 5 (B) 3
(C) -1 (D) 1

Q26. For any vector $\vec{a}$, $\vec{a} \times \vec{a}$ equals

(A) the zero vector (B) $\vec{a}$
(C) $|\vec{a}|^2$ (D) 1

Q27. The unit vector along $\hat{i} + \hat{j} + \hat{k}$ is
(A) $(\hat{i} + \hat{j} + \hat{k})/\sqrt{2}$ (B) $(\hat{i} + \hat{j} + \hat{k})/3$
(C) $(\hat{i} + \hat{j} + \hat{k})/\sqrt{3}$ (D) $\hat{i} + \hat{j} + \hat{k}$

Q28. If l, m, n are direction cosines of a line, then $l^2 + m^2 + n^2$ equals
(A) 3 (B) -1
(C) 0 (D) 1

Q29. The angle between the planes $x + y = 1$ and $x - y = 2$ is
(A) 45° (B) 90°
(C) 60° (D) 0°

Q30. The distance between (1, 2, 3) and (4, 6, 3) is
(A) 25 (B) $\sqrt{7}$
(C) 5 (D) 7

Q31. $Z = 3x + 2y$ at corner points (0, 0), (4, 0), (0, 6) and (3, 2). The maximum of Z is
(A) 0 (B) 12
(C) 15 (D) 13

Q32. In a linear programming problem, the objective function is
(A) linear (B) always constant
(C) quadratic (D) exponential

Q33. $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$. Then $P(A \mid B)$ is
(A) 0.3 (B) 0.9
(C) 0.6 (D) 0.5

Q34. A and B are independent if
(A) $P(A) = P(B)$ (B) $P(A \cup B) = 1$
(C) $P(A \cap B) = P(A)\,P(B)$ (D) $P(A \cap B) = 0$

Q35. Two fair coins are tossed. The probability of exactly one head is
(A) 1/4 (B) 1/2
(C) 3/4 (D) 1/3

Q36. The mean of a binomial distribution with $n = 10$ and $p = 0.4$ is
(A) 2.4 (B) 6
(C) 10 (D) 4

Q37. The variance of a binomial distribution with $n = 10$ and $p = 0.4$ is
(A) 2.4 (B) 6
(C) 4 (D) 1.6

Q38. A bag has 3 red and 2 black balls. Two are drawn without replacement. P(both red) is
(A) 9/25 (B) 1/10
(C) 3/10 (D) 3/5

Q39. $d/dx\,(\tan x)$ equals
(A) $-\text{cosec}^2 x$ (B) $\cot x$
(C) $\sec x \tan x$ (D) $\sec^2 x$

Q40. $\int \sec^2 x\, dx$ equals

(A) $\cot x + C$ (B) $\tan x + C$
(C) $\sec x + C$ (D) $-\tan x + C$

Q41. If A is the 2×2 matrix with rows (2, 3) and (1, 4), then $|A|$ is

(A) -5 (B) 11
(C) 8 (D) 5

Q42. If A is a symmetric matrix, then

(A) $A^2 = I$ (B) $|A| = 0$
(C) $A^T = -A$ (D) $A^T = A$

Q43. The number of 2×2 matrices whose entries are each 0 or 1 is

(A) 4 (B) 32
(C) 8 (D) 16

Q44. $f(x) = (x^2 - 1)/(x - 1)$ for $x \neq 1$ and $f(1) = k$. f is continuous at $x = 1$ when k is

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

Q45. The slope of the tangent to $y = x^2$ at (2, 4) is

(A) 8 (B) 4
(C) 1 (D) 2

Q46. $\int_{-1}^{1} x^3\, dx$ equals

(A) 0 (B) 1/4
(C) 2 (D) 1/2

Q47. The line through the origin with direction ratios 1, 2, 3 is

(A) $x + 2y + 3z = 0$ (B) $x/1 = y/2 = z/3$
(C) $x = 1, y = 2, z = 3$ (D) $x/3 = y/2 = z/1$

Q48. The projection of $a = 2\hat{i} + 3\hat{j}$ on $\hat{i}$ is

(A) $\sqrt{13}$ (B) 5
(C) 2 (D) 3

Q49. The integrating factor of $dy/dx + 2y = e^x$ is

(A) e^{-2x} (B) e^x
(C) e^{2x} (D) $2x$

Q50. If P(A) = 0.35, then P(not A) is

(A) 0.5 (B) 0.65
(C) 0.7 (D) 0.35

Answer key

Q1 C	**Q2** A	**Q3** B	**Q4** D	**Q5** D
Q6 B	**Q7** D	**Q8** A	**Q9** A	**Q10** A
Q11 C	**Q12** C	**Q13** A	**Q14** C	**Q15** C
Q16 B	**Q17** B	**Q18** C	**Q19** D	**Q20** A
Q21 C	**Q22** A	**Q23** B	**Q24** C	**Q25** D
Q26 A	**Q27** C	**Q28** D	**Q29** B	**Q30** C
Q31 D	**Q32** A	**Q33** C	**Q34** C	**Q35** B
Q36 D	**Q37** A	**Q38** C	**Q39** D	**Q40** B
Q41 D	**Q42** D	**Q43** D	**Q44** B	**Q45** B
Q46 A	**Q47** B	**Q48** C	**Q49** C	**Q50** B

Solutions

Q1 · Answer: **(C) −2**
$4 - 6 = -2$.

Q2 · Answer: **(A) 25**
$|A|^{n-1} = 5^2 = 25$.

Q3 · Answer: **(B) 1/2 and 1/4**
Invert each diagonal entry.

Q4 · Answer: **(D) B^TA^T**
Reversal law.

Q5 · Answer: **(D) π/6**
$\sin(\pi/6) = 1/2$.

Q6 · Answer: **(B) π**
$\cos \pi = -1$.

Q7 · Answer: **(D) an equivalence relation**
The identity relation is reflexive, symmetric and transitive.

Q8 · Answer: **(A) (x − 3)/2**
Solve $y = 2x + 3$ for x.

Q9 · Answer: **(A) $3e^{3x}$**
Chain rule.

Q10 · Answer: **(A) 1/2**
1/x.

Q11 · Answer: **(C) cos 2x**
½ sin 2x differentiates to cos 2x.

Q12 · Answer: **(C) 1**
$(x - 2)^2 + 1$.

Q13 · Answer: **(A) 20π cm²/s**
$dA/dt = 2\pi r\, dr/dt$.

Q14 · Answer: **(C) all real numbers**
$f'(x) = 3x^2 \geq 0$.

Q15 · Answer: **(C) $x^2 + C$**

Q16 · Answer: **(B) sin x + C**

Q17 · Answer: **(B) 1/3**

Q18 · Answer: **(C) log|x| + C**

Q19 · Answer: **(D) 2**
[−cos x] from 0 to π.

Q20 · Answer: **(A) 2 square units**
Triangle ½ × 2 × 2.

Q21 · Answer: **(C) 2**
Highest derivative.

Q22 · Answer: **(A) $y = x^2 + C$**

Q23 · Answer: **(B) $y = Ce^x$**

Q24 · Answer: **(C) 7**
√(4 + 9 + 36).

Q25 · Answer: **(D) 1**
3 − 2.

Q26 · Answer: **(A) the zero vector**
sin 0 = 0.

Q27 · Answer: **(C) $(\hat{i} + \hat{j} + \hat{k})/\sqrt{3}$**

Q28 · Answer: **(D) 1**

Q29 · Answer: **(B) 90°**
Normals (1, 1, 0) and (1, −1, 0) are perpendicular.

Q30 · Answer: **(C) 5**
√(9 + 16 + 0).

Q31 · Answer: **(D) 13**
Z(3, 2) = 13 is the largest.

Q32 · Answer: **(A) linear**

Q33 · Answer: **(C) 0.6**
0.3/0.5.

Q34 · Answer: **(C) $P(A \cap B) = P(A)\,P(B)$**

Q35 · Answer: **(B) 1/2**
HT or TH.

Q36 · Answer: **(D) 4**
np.

Q37 · Answer: **(A) 2.4**
npq = 10 × 0.4 × 0.6.

Q38 · Answer: **(C) 3/10**
3/5 × 2/4.

Q39 · Answer: **(D) $\sec^2 x$**

Q40 · Answer: **(B) tan x + C**

Q41 · Answer: **(D) 5**
8 − 3.

Q42 · Answer: **(D) $A^T = A$**

Q43 · Answer: **(D) 16**
2^4.

Q44 · Answer: **(B) 2**
The limit is x + 1 = 2.

Q45 · Answer: **(B) 4**
2x at x = 2.

Q46 · Answer: **(A) 0**
Odd function over a symmetric interval.

Q47 · Answer: **(B) x/1 = y/2 = z/3**

Q48 · Answer: **(C) 2**
a · î.

Q49 · Answer: **(C) e^{2x}**
e^(∫2 dx).

Q50 · Answer: **(B) 0.65**
1 − 0.35.