

NDA MATHEMATICS

120 MIXED PRACTICE QUESTIONS

Based on Class XI & XII Mathematics

TOTAL QUESTIONS	TIME ALLOWED	LEVEL
120	**150 Minutes**	**NDA Practice**

Instructions

1. All questions are objective type with four options.
2. Choose the most appropriate answer.
3. Questions are mixed and are not arranged chapter-wise.
4. Detailed solutions and a quick answer key are provided after Question 120.

Prepared for Defence Dreams aspirants

PRACTICE QUESTION PAPER

Time: 150 Minutes | Questions: 120

Q1. The slope of the tangent to $y=x^2+2x$ at $x=3$ is:
(A) 2 (B) 8 (C) 5 (D) 12

Q2. Find the coefficient of x^2 in (1+x)^8.
(A) 23 (B) 28 (C) 31 (D) 26

Q3. Find the distance between (4,0,0) and (0,5,0) in 3D.
(A) 6.403 (B) 8.903 (C) 7.653 (D) 4.903

Q4. If $f(x)=2x^3+3x^2-4x+7$, find $f'(2)$.
(A) 32 (B) 36 (C) 29 (D) 26

Q5. Evaluate $\lim x\to 2\ (x^2-4)/(x-2)$.
(A) 7 (B) -1 (C) 4 (D) 2

Q6. Find the number of solutions of $\sin x=0$ in $0\le x\le 2\pi$.
(A) -6 (B) 3 (C) -3 (D) 10

Q7. Find the distance between (3,0,0) and (0,4,0) in 3D.
(A) 0 (B) 5 (C) 3 (D) 8

Q8. If $n(A)=5$, $n(B)=6$, and $n(A\cap B)=2$, find $n(A\cup B)$.
(A) 6 (B) 13 (C) 9 (D) 3

Q9. Find the determinant of [[1, 2], [3, 3]].
(A) 0 (B) -8 (C) -5 (D) -3

Q10. If $a=6i+2j$ and $b=i+7j$, find $a\cdot b$.
(A) 11 (B) 20 (C) 27 (D) 14

Q11. Find the distance between (7,0,0) and (0,8,0) in 3D.
(A) 11.88 (B) 10.63 (C) 9.13 (D) 13.13

Q12. Find the number of solutions of $\sin x=0$ in $0\le x\le 5\pi$.
(A) 6 (B) 1 (C) 12 (D) -2

Q13. If $z=1+4i$, find $|z|^2$.
(A) 20 (B) 17 (C) 15 (D) 12

Q14. How many distinct arrangements can be made by selecting and arranging 3 objects from 10 distinct objects?
(A) 720 (B) 714 (C) 711 (D) 727

Q15. If $z=4+4i$, find $|z|^2$.
(A) 24 (B) 38 (C) 32 (D) 27

Q16. Evaluate $\int_0^2 (4x+5)\,dx$.
(A) 24 (B) 18 (C) 13 (D) 10

Q17. Find the mean of 2, 4, 6, and 4.
(A) 7 (B) 4 (C) -1 (D) 2

Q18. Solve $dy/dx=1x$, given $y=2$ when $x=0$. Find y when $x=2$.
(A) 4 (B) 2 (C) -1 (D) 7

Q19. Find the radius of $x^2+y^2-10x-6y+(30)=0$.
(A) -4 (B) 2 (C) 9 (D) -7

Q20. Find the radius of $x^2+y^2-6x-6y+(14)=0$.

(A) 2 (B) -5 (C) -2 (D) 7

Q21. Find the number of solutions of sin x=0 in $0 \leq x \leq 2\pi$.

(A) 3 (B) 1 (C) -2 (D) 6

Q22. Find the mean of 3, 5, 8, and 6.

(A) 8 (B) 5.5 (C) 4 (D) 6.75

Q23. Find the radius of $x^2+y^2-2x-6y+(6)=0$.

(A) -3 (B) 0 (C) 5 (D) 2

Q24. Find the sum of the first 6 terms of the GP with first term 4 and common ratio 2.

(A) 252 (B) 244 (C) 258 (D) 247

Q25. A fair die is thrown once. Find the probability of obtaining a number greater than 3.

(A) -1 (B) 1.75 (C) 3 (D) 1/2

Q26. Find the distance between (4, 0) and (7, 4).

(A) -1 (B) 5 (C) -4 (D) 12

Q27. Find the distance between (1, 0) and (4, 4).

(A) 9 (B) 5 (C) -1 (D) 2

Q28. If a=3i+2j and b=i+4j, find a·b.

(A) 8 (B) 15 (C) 11 (D) 5

Q29. If sin θ=3/5 and θ is acute, find cos θ.

(A) 4/5 (B) -0.7 (C) 2.05 (D) 3.3

Q30. Simplify $\log_{10}(10^3)+\log_{10}(10^4)$.

(A) 3 (B) 12 (C) 0 (D) 7

Q31. If sin θ=3/5 and θ is acute, find cos θ.

(A) 2.05 (B) -0.7 (C) 3.3 (D) 4/5

Q32. Find the coefficient of x^3 in $(1+x)^9$.

(A) 88 (B) 78 (C) 81 (D) 84

Q33. Solve dy/dx=3x, given y=2 when x=0. Find y when x=2.

(A) 8 (B) 4 (C) 13 (D) 1

Q34. Find the mean of 4, 6, 10, and 8.

(A) 12 (B) 3 (C) 0 (D) 7

Q35. Evaluate $\lim_{x \to 3} (x^2-9)/(x-3)$.

(A) 3 (B) 10 (C) 0 (D) 6

Q36. Evaluate the determinant |3 2; 1 5|.

(A) 7 (B) 10 (C) 17 (D) 13

Q37. Find the 10th term of the AP 5, 9, 13, ...

(A) 46 (B) 41 (C) 37 (D) 34

Q38. If z=4+3i, find the real part of z^2.

(A) 7 (B) 3 (C) 0 (D) 12

Q39. Evaluate $\lim_{x \to 5} (x^2-25)/(x-5)$.

(A) 10 (B) 5 (C) 16 (D) 2

Q40. Evaluate the determinant |2 1; 1 4|.

(A) 10 (B) 2 (C) 7 (D) 5

Q41. If a=4i+2j and b=i+5j, find a·b.
(A) 7 (B) 19 (C) 14 (D) 10

Q42. Find the distance between (6,0,0) and (0,7,0) in 3D.
(A) 10.47 (B) 7.72 (C) 9.22 (D) 11.72

Q43. If the roots of $x^2 - 10x + 24 = 0$ are α and β, find $\alpha^2 + \beta^2$.
(A) 45 (B) 48 (C) 52 (D) 57

Q44. Simplify $\log_{10}(10^2)+\log_{10}(10^3)$.
(A) -1 (B) 5 (C) 9 (D) 2

Q45. Find the distance between (5,0,0) and (0,6,0) in 3D.
(A) 7.81 (B) 10.31 (C) 6.31 (D) 9.06

Q46. If a=2i+2j and b=i+3j, find a·b.
(A) 11 (B) 6 (C) 8 (D) 3

Q47. If z=5+4i, find the real part of z^2.
(A) 15 (B) 1 (C) 9 (D) 4

Q48. Find the mean of 5, 7, 12, and 10.
(A) 9.75 (B) 8.5 (C) 11 (D) 7

Q49. Solve dy/dx=5x, given y=2 when x=0. Find y when x=2.
(A) 6 (B) 19 (C) 3 (D) 12

Q50. Find the sum of the first 3 terms of the GP with first term 1 and common ratio 2.
(A) 7 (B) 10 (C) 2 (D) 5

Q51. How many distinct arrangements can be made by selecting and arranging 3 objects from 7 distinct objects?
(A) 207 (B) 204 (C) 214 (D) 210

Q52. A fair die is thrown once. Find the probability of obtaining a number greater than 4.
(A) -1.167 (B) 1/3 (C) 1.583 (D) 2.833

Q53. Find the coefficient of x^2 in (1+x)^11.
(A) 50 (B) 55 (C) 61 (D) 47

Q54. If $f(x)=3x^3+4x^2-4x+7$, find $f'(2)$.
(A) 41 (B) 48 (C) 53 (D) 44

Q55. Find the 11th term of the AP 6, 11, 16, ...
(A) 48 (B) 62 (C) 51 (D) 56

Q56. If sin θ=3/5 and θ is acute, find cos θ.
(A) -0.7 (B) 2.05 (C) 4/5 (D) 3.3

Q57. Evaluate lim $x\to4$ $(x^2-16)/(x-4)$.
(A) 1 (B) 4 (C) 8 (D) 13

Q58. Evaluate the determinant |5 4; 1 7|.
(A) 37 (B) 31 (C) 23 (D) 26

Q59. Find the 9th term of the AP 4, 7, 10, ...
(A) 28 (B) 25 (C) 22 (D) 32

Q60. Find the mean of 6, 8, 14, and 12.
(A) 17 (B) 10 (C) 4 (D) 1

Q61. If $f(x)=4x^3+5x^2-4x+7$, find $f'(2)$.

(A) 59 (B) 56 (C) 64 (D) 70

Q62. Evaluate the determinant |6 5; 1 8|.

(A) 37 (B) 34 (C) 43 (D) 50

Q63. Solve dy/dx=4x, given y=2 when x=0. Find y when x=2.

(A) 2 (B) 5 (C) 16 (D) 10

Q64. If the roots of $x^2 - 6x + 8 = 0$ are α and β, find $\alpha^2 + \beta^2$.

(A) 20 (B) 15 (C) 23 (D) 18

Q65. Find the distance between (3, 0) and (6, 4).

(A) 5 (B) 11 (C) 0 (D) -3

Q66. How many distinct arrangements can be made by selecting and arranging 2 objects from 6 distinct objects?

(A) 25 (B) 33 (C) 28 (D) 30

Q67. Simplify $\log_{10}(10^5)+\log_{10}(10^6)$.

(A) 5 (B) 11 (C) 18 (D) 2

Q68. If $\sin\theta=3/5$ and θ is acute, find $\cos\theta$.

(A) 2.05 (B) 4/5 (C) -0.7 (D) 3.3

Q69. A fair die is thrown once. Find the probability of obtaining a number greater than 2.

(A) 3.167 (B) 2/3 (C) 1.917 (D) -0.833

Q70. Find the determinant of [[5, 2], [3, 7]].

(A) 23 (B) 36 (C) 20 (D) 29

Q71. Evaluate $\int_0^2 (5x+6)\,dx$.

(A) 16 (B) 29 (C) 13 (D) 22

Q72. Evaluate $\int_0^2 (1x+2)\,dx$.

(A) 4 (B) 6 (C) 1 (D) 9

Q73. How many distinct arrangements can be made by selecting and arranging 4 objects from 8 distinct objects?

(A) 1680 (B) 1685 (C) 1673 (D) 1676

Q74. Find the 8th term of the AP 3, 5, 7, ...

(A) 20 (B) 12 (C) 15 (D) 17

Q75. Find the 12th term of the AP 7, 13, 19, ...

(A) 80 (B) 73 (C) 67 (D) 64

Q76. If n(A)=6, n(B)=7, and $n(A\cap B)=2$, find $n(A\cup B)$.

(A) 7 (B) 4 (C) 11 (D) 16

Q77. Find the sum of the first 7 terms of the GP with first term 5 and common ratio 2.

(A) 629 (B) 635 (C) 642 (D) 626

Q78. If $z=3+4i$, find $|z|^2$.

(A) 21 (B) 30 (C) 25 (D) 18

Q79. Evaluate $\int_0^2 (3x+4)\,dx$.

(A) 7 (B) 10 (C) 14 (D) 19

Q80. If $a=5i+2j$ and $b=i+6j$, find $a\cdot b$.

(A) 9 (B) 17 (C) 12 (D) 23

Q81. The slope of the tangent to $y=x^2+1x$ at $x=3$ is:
(A) 2 (B) 10 (C) 7 (D) 5

Q82. The slope of the tangent to $y=x^2+4x$ at $x=3$ is:
(A) 10 (B) 5 (C) 16 (D) 2

Q83. If $z=2+1i$, find the real part of z^2.
(A) 3 (B) -2 (C) 6 (D) 1

Q84. If $z=3+2i$, find the real part of z^2.
(A) -1 (B) 5 (C) 9 (D) 2

Q85. A fair die is thrown once. Find the probability of obtaining a number greater than 1.
(A) 2.083 (B) 3.333 (C) 5/6 (D) -0.667

Q86. If $n(A)=8$, $n(B)=9$, and $n(A\cap B)=2$, find $n(A\cup B)$.
(A) 6 (B) 9 (C) 15 (D) 22

Q87. If $z=6+5i$, find the real part of z^2.
(A) 18 (B) 11 (C) 2 (D) 5

Q88. Find the coefficient of x^3 in (1+x)^12.
(A) 211 (B) 227 (C) 220 (D) 214

Q89. If $\sin\theta=3/5$ and θ is acute, find $\cos\theta$.
(A) 2.05 (B) 3.3 (C) 4/5 (D) -0.7

Q90. Find the determinant of [[3, 2], [3, 5]].
(A) 5 (B) 2 (C) 9 (D) 14

Q91. If the roots of $x^2 - 14x + 48 = 0$ are α and β, find $\alpha^2 + \beta^2$.
(A) 91 (B) 107 (C) 100 (D) 94

Q92. Evaluate $\int_0^2 (2x+3)\,dx$.
(A) 10 (B) 4 (C) 14 (D) 7

Q93. If the roots of $x^2 - 8x + 15 = 0$ are α and β, find $\alpha^2 + \beta^2$.
(A) 38 (B) 31 (C) 34 (D) 28

Q94. The slope of the tangent to $y=x^2+3x$ at $x=3$ is:
(A) 5 (B) 2 (C) 9 (D) 14

Q95. If $z=5+4i$, find $|z|^2$.
(A) 35 (B) 48 (C) 41 (D) 32

Q96. Find the number of solutions of $\sin x=0$ in $0\le x\le 4\pi$.
(A) -2 (B) 5 (C) 1 (D) 10

Q97. Simplify $\log_{10}(10^4)+\log_{10}(10^5)$.
(A) 15 (B) 1 (C) 4 (D) 9

Q98. If $n(A)=7$, $n(B)=8$, and $n(A\cap B)=2$, find $n(A\cup B)$.
(A) 8 (B) 13 (C) 19 (D) 5

Q99. Find the sum of the first 4 terms of the GP with first term 2 and common ratio 2.
(A) 24 (B) 30 (C) 34 (D) 27

Q100. Evaluate the determinant |4 3; 1 6|.
(A) 14 (B) 17 (C) 21 (D) 26

Q101. If $z=2+4i$, find $|z|^2$.
(A) 20 (B) 14 (C) 17 (D) 24

Q102. Evaluate lim x→6 (x²−36)/(x−6).

(A) 19 (B) 6 (C) 3 (D) 12

Q103. If f(x)=5x³+6x²−4x+7, find f′(2).

(A) 74 (B) 87 (C) 71 (D) 80

Q104. How many distinct arrangements can be made by selecting and arranging 2 objects from 9 distinct objects?

(A) 78 (B) 72 (C) 64 (D) 67

Q105. Find the determinant of [[2, 2], [3, 4]].

(A) -4 (B) -1 (C) 6 (D) 2

Q106. Find the coefficient of x^4 in (1+x)^10.

(A) 203 (B) 215 (C) 206 (D) 210

Q107. The slope of the tangent to y=x²+5x at x=3 is:

(A) 11 (B) 5 (C) 18 (D) 2

Q108. Find the distance between (2, 0) and (5, 4).

(A) 10 (B) -2 (C) 1 (D) 5

Q109. Solve dy/dx=2x, given y=2 when x=0. Find y when x=2.

(A) 10 (B) 3 (C) 6 (D) 0

Q110. Find the distance between (0, 0) and (3, 4).

(A) 0 (B) 5 (C) 8 (D) 3

Q111. Find the radius of x²+y²−8x−6y+(21)=0.

(A) -3 (B) 8 (C) -6 (D) 2

Q112. If the roots of x² − 12x + 35 = 0 are α and β, find α² + β².

(A) 66 (B) 74 (C) 69 (D) 80

Q113. Simplify $\log_{10}$(10^1)+$\log_{10}$(10^2).

(A) 6 (B) 1 (C) 3 (D) -2

Q114. Find the determinant of [[4, 2], [3, 6]].

(A) 10 (B) 24 (C) 18 (D) 13

Q115. If n(A)=4, n(B)=5, and n(A∩B)=2, find n(A∪B).

(A) 2 (B) 7 (C) 10 (D) 5

Q116. A fair die is thrown once. Find the probability of obtaining a number greater than 1.

(A) 2.083 (B) 3.333 (C) 5/6 (D) -0.667

Q117. Find the number of solutions of sin x=0 in 0≤x≤3π.

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

Q118. Find the radius of x²+y²−4x−6y+(9)=0.

(A) -4 (B) 6 (C) 2 (D) -1

Q119. If f(x)=1x³+2x²−4x+7, find f′(2).

(A) 19 (B) 16 (C) 11 (D) 14

Q120. Find the sum of the first 5 terms of the GP with first term 3 and common ratio 2.

(A) 98 (B) 86 (C) 89 (D) 93

DETAILED SOLUTIONS

Review the working and the mathematical rule used in each solution.

Q1. Answer: (B) 8
dy/dx=2x+2. At x=3, slope=6+2=8.

Q2. Answer: (B) 28
Coefficient = C(8,2) = 28.

Q3. Answer: (A) 6.403
Distance=$\sqrt{[a^2+b^2]}=\sqrt{41}=6.403$.

Q4. Answer: (A) 32
$f'(x)=6x^2+6x-4$. Therefore $f'(2)=6\times4+6\times2-4=32$.

Q5. Answer: (C) 4
$x^2-a^2=(x-a)(x+a)$. Cancelling $x-a$, the limit is $x+a$ at $x=a$, i.e. 4.

Q6. Answer: (B) 3
sin x=0 when $x=k\pi$. Here k=0,1,...,2; hence there are 3 solutions.

Q7. Answer: (B) 5
Distance=$\sqrt{[a^2+b^2]}=\sqrt{25}=5$.

Q8. Answer: (C) 9
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=5+6-2=9$.

Q9. Answer: (D) -3
For a 2×2 matrix, $det=ad-bc=1\times3-2\times3=-3$.

Q10. Answer: (B) 20
$a\cdot b=(6)(1)+(2)(7)=20$.

Q11. Answer: (B) 10.63
Distance=$\sqrt{[a^2+b^2]}=\sqrt{113}=10.63$.

Q12. Answer: (A) 6
sin x=0 when $x=k\pi$. Here k=0,1,...,5; hence there are 6 solutions.

Q13. Answer: (B) 17
$|z|^2=(1)^2+4^2=17$.

Q14. Answer: (A) 720
${}^nP_r=n!/(n-r)!=720$.

Q15. Answer: (C) 32
$|z|^2=(4)^2+4^2=32$.

Q16. Answer: (B) 18
$\int(4x+5)dx=(4/2)x^2+5x$. From 0 to 2: 2(4)+2(5)=18.

Q17. Answer: (B) 4
Mean=sum/4=(2+4+6+4)/4=4.

Q18. Answer: (A) 4
Integrating, $y=(1/2)x^2+C$. Since y(0)=2, C=2. Thus y(2)=2+2(1)=4.

Q19. Answer: (B) 2
Here g=−5, f=−3, c=30. $Radius^2=g^2+f^2-c=25+9-(30)=4$. Radius=2.

Q20. Answer: (A) 2
Here $g=-3$, $f=-3$, $c=14$. Radius$^2=g^2+f^2-c=9+9-(14)=4$. Radius$=2$.

Q21. Answer: (A) 3
$\sin x=0$ when $x=k\pi$. Here $k=0,1,\ldots,2$; hence there are 3 solutions.

Q22. Answer: (B) 5.5
Mean=sum/4=(3+5+8+6)/4=5.5.

Q23. Answer: (D) 2
Here $g=-1$, $f=-3$, $c=6$. Radius$^2=g^2+f^2-c=1+9-(6)=4$. Radius$=2$.

Q24. Answer: (A) 252
$S_n=a(r^n-1)/(r-1)=4\times(2\text{^}6-1)/(2-1)=252$.

Q25. Answer: (D) 1/2
Favourable outcomes: 4 to 6, i.e. 3 outcomes. Probability$=3/6=1/2$.

Q26. Answer: (B) 5
Distance$=\sqrt{[(7-4)^2+(4-0)^2]}=\sqrt{25}=5$.

Q27. Answer: (B) 5
Distance$=\sqrt{[(4-1)^2+(4-0)^2]}=\sqrt{25}=5$.

Q28. Answer: (C) 11
$a\cdot b=(3)(1)+(2)(4)=11$.

Q29. Answer: (A) 4/5
$\sin^2\theta+\cos^2\theta=1$. Thus $\cos\theta=\sqrt{(1-9/25)}=\sqrt{(16/25)}=4/5$.

Q30. Answer: (D) 7
$\log_{10}(10\text{^}3)+\log_{10}(10\text{^}4)=3+4=7$.

Q31. Answer: (D) 4/5
$\sin^2\theta+\cos^2\theta=1$. Thus $\cos\theta=\sqrt{(1-9/25)}=\sqrt{(16/25)}=4/5$.

Q32. Answer: (D) 84
Coefficient = C(9,3) = 84.

Q33. Answer: (A) 8
Integrating, $y=(3/2)x^2+C$. Since $y(0)=2$, $C=2$. Thus $y(2)=2+2(3)=8$.

Q34. Answer: (D) 7
Mean=sum/4=(4+6+10+8)/4=7.

Q35. Answer: (D) 6
$x^2-a^2=(x-a)(x+a)$. Cancelling $x-a$, the limit is $x+a$ at $x=a$, i.e. 6.

Q36. Answer: (D) 13
Determinant$=ad-bc=(3)(5)-(2)(1)=13$.

Q37. Answer: (B) 41
$a_n=a+(n-1)d=5+(10-1)\times4=41$.

Q38. Answer: (A) 7
$z^2=(a+bi)^2=(a^2-b^2)+2abi$. Real part$=4^2-3^2=7$.

Q39. Answer: (A) 10
$x^2-a^2=(x-a)(x+a)$. Cancelling $x-a$, the limit is $x+a$ at $x=a$, i.e. 10.

Q40. Answer: (C) 7
Determinant$=ad-bc=(2)(4)-(1)(1)=7$.

Q41. Answer: (C) 14
$a \cdot b = (4)(1)+(2)(5)=14$.

Q42. Answer: (C) 9.22
Distance $=\sqrt{[a^2+b^2]}=\sqrt{85}=9.22$.

Q43. Answer: (C) 52
Using $\alpha+\beta=10$ and $\alpha\beta=24$, $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=10^2-2(24)=52$.

Q44. Answer: (B) 5
$\log_{10}(10\text{^}2)+\log_{10}(10\text{^}3)=2+3=5$.

Q45. Answer: (A) 7.81
Distance $=\sqrt{[a^2+b^2]}=\sqrt{61}=7.81$.

Q46. Answer: (C) 8
$a \cdot b = (2)(1)+(2)(3)=8$.

Q47. Answer: (C) 9
$z^2=(a+bi)^2=(a^2-b^2)+2abi$. Real part $=5^2-4^2=9$.

Q48. Answer: (B) 8.5
Mean=sum/4=(5+7+12+10)/4=8.5.

Q49. Answer: (D) 12
Integrating, $y=(5/2)x^2+C$. Since $y(0)=2$, $C=2$. Thus $y(2)=2+2(5)=12$.

Q50. Answer: (A) 7
$S_n=a(r^n-1)/(r-1)=1\times(2\text{^}3-1)/(2-1)=7$.

Q51. Answer: (D) 210
${}^nP_r=n!/(n-r)!=210$.

Q52. Answer: (B) 1/3
Favourable outcomes: 5 to 6, i.e. 2 outcomes. Probability=2/6=1/3.

Q53. Answer: (B) 55
Coefficient = C(11,2) = 55.

Q54. Answer: (B) 48
$f'(x)=9x^2+8x-4$. Therefore $f'(2)=9\times4+8\times2-4=48$.

Q55. Answer: (D) 56
$a_n=a+(n-1)d=6+(11-1)\times5=56$.

Q56. Answer: (C) 4/5
$\sin^2\theta+\cos^2\theta=1$. Thus $\cos\theta=\sqrt{(1-9/25)}=\sqrt{(16/25)}=4/5$.

Q57. Answer: (C) 8
$x^2-a^2=(x-a)(x+a)$. Cancelling $x-a$, the limit is $x+a$ at $x=a$, i.e. 8.

Q58. Answer: (B) 31
Determinant=$ad-bc=(5)(7)-(4)(1)=31$.

Q59. Answer: (A) 28
$a_n=a+(n-1)d=4+(9-1)\times3=28$.

Q60. Answer: (B) 10
Mean=sum/4=(6+8+14+12)/4=10.

Q61. Answer: (C) 64
$f'(x)=12x^2+10x-4$. Therefore $f'(2)=12\times4+10\times2-4=64$.

Q62. Answer: (C) 43
Determinant=ad−bc=(6)(8)−(5)(1)=43.

Q63. Answer: (D) 10
Integrating, $y=(4/2)x^2+C$. Since y(0)=2, C=2. Thus y(2)=2+2(4)=10.

Q64. Answer: (A) 20
Using α+β=6 and αβ=8, $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=6^2-2(8)=20$.

Q65. Answer: (A) 5
Distance=$\sqrt{[(6-3)^2+(4-0)^2]}=\sqrt{25}=5$.

Q66. Answer: (D) 30
${}^nP_r=n!/(n-r)!=30$.

Q67. Answer: (B) 11
$\log_{10}(10\text{^}5)+\log_{10}(10\text{^}6)=5+6=11$.

Q68. Answer: (B) 4/5
$\sin^2\theta+\cos^2\theta=1$. Thus $\cos\theta=\sqrt{(1-9/25)}=\sqrt{(16/25)}=4/5$.

Q69. Answer: (B) 2/3
Favourable outcomes: 3 to 6, i.e. 4 outcomes. Probability=4/6=2/3.

Q70. Answer: (D) 29
For a 2×2 matrix, det=ad−bc=5×7−2×3=29.

Q71. Answer: (D) 22
$\int(5x+6)dx=(5/2)x^2+6x$. From 0 to 2: 2(5)+2(6)=22.

Q72. Answer: (B) 6
$\int(1x+2)dx=(1/2)x^2+2x$. From 0 to 2: 2(1)+2(2)=6.

Q73. Answer: (A) 1680
${}^nP_r=n!/(n-r)!=1680$.

Q74. Answer: (D) 17
$a_n=a+(n-1)d=3+(8-1)\times2=17$.

Q75. Answer: (B) 73
$a_n=a+(n-1)d=7+(12-1)\times6=73$.

Q76. Answer: (C) 11
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=6+7-2=11$.

Q77. Answer: (B) 635
$S_n=a(r^n-1)/(r-1)=5\times(2\text{^}7-1)/(2-1)=635$.

Q78. Answer: (C) 25
$|z|^2=(3)^2+4^2=25$.

Q79. Answer: (C) 14
$\int(3x+4)dx=(3/2)x^2+4x$. From 0 to 2: 2(3)+2(4)=14.

Q80. Answer: (B) 17
$a\cdot b=(5)(1)+(2)(6)=17$.

Q81. Answer: (C) 7
dy/dx=2x+1. At x=3, slope=6+1=7.

Q82. Answer: (A) 10
dy/dx=2x+4. At x=3, slope=6+4=10.

Q83. Answer: (A) 3
$z^2=(a+bi)^2=(a^2-b^2)+2abi$. Real part=$2^2-1^2=3$.

Q84. Answer: (B) 5
$z^2=(a+bi)^2=(a^2-b^2)+2abi$. Real part=$3^2-2^2=5$.

Q85. Answer: (C) 5/6
Favourable outcomes: 2 to 6, i.e. 5 outcomes. Probability=5/6=5/6.

Q86. Answer: (C) 15
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=8+9-2=15$.

Q87. Answer: (B) 11
$z^2=(a+bi)^2=(a^2-b^2)+2abi$. Real part=$6^2-5^2=11$.

Q88. Answer: (C) 220
Coefficient = C(12,3) = 220.

Q89. Answer: (C) 4/5
$\sin^2\theta+\cos^2\theta=1$. Thus $\cos\theta=\sqrt{(1-9/25)}=\sqrt{(16/25)}=4/5$.

Q90. Answer: (C) 9
For a 2×2 matrix, det=ad−bc=3×5−2×3=9.

Q91. Answer: (C) 100
Using $\alpha+\beta=14$ and $\alpha\beta=48$, $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=14^2-2(48)=100$.

Q92. Answer: (A) 10
$\int(2x+3)dx=(2/2)x^2+3x$. From 0 to 2: 2(2)+2(3)=10.

Q93. Answer: (C) 34
Using $\alpha+\beta=8$ and $\alpha\beta=15$, $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=8^2-2(15)=34$.

Q94. Answer: (C) 9
$dy/dx=2x+3$. At x=3, slope=6+3=9.

Q95. Answer: (C) 41
$|z|^2=(5)^2+4^2=41$.

Q96. Answer: (B) 5
sin x=0 when $x=k\pi$. Here k=0,1,...,4; hence there are 5 solutions.

Q97. Answer: (D) 9
$\log_{10}(10\text{^}4)+\log_{10}(10\text{^}5)=4+5=9$.

Q98. Answer: (B) 13
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=7+8-2=13$.

Q99. Answer: (B) 30
$S_n=a(r^n-1)/(r-1)=2\times(2\text{^}4-1)/(2-1)=30$.

Q100. Answer: (C) 21
Determinant=ad−bc=(4)(6)−(3)(1)=21.

Q101. Answer: (A) 20
$|z|^2=(2)^2+4^2=20$.

Q102. Answer: (D) 12
$x^2-a^2=(x-a)(x+a)$. Cancelling x−a, the limit is x+a at x=a, i.e. 12.

Q103. Answer: (D) 80
$f'(x)=15x^2+12x-4$. Therefore $f'(2)=15\times4+12\times2-4=80$.

Q104. Answer: (B) 72
${}^{n}P_{r}=n!/(n-r)!=72$.

Q105. Answer: (D) 2
For a 2×2 matrix, det=ad−bc=2×4−2×3=2.

Q106. Answer: (D) 210
Coefficient = C(10,4) = 210.

Q107. Answer: (A) 11
dy/dx=2x+5. At x=3, slope=6+5=11.

Q108. Answer: (D) 5
Distance=$\sqrt{[(5-2)^2+(4-0)^2]}=\sqrt{25}=5$.

Q109. Answer: (C) 6
Integrating, $y=(2/2)x^2+C$. Since y(0)=2, C=2. Thus y(2)=2+2(2)=6.

Q110. Answer: (B) 5
Distance=$\sqrt{[(3-0)^2+(4-0)^2]}=\sqrt{25}=5$.

Q111. Answer: (D) 2
Here g=−4, f=−3, c=21. Radius$^2=g^2+f^2-c=16+9-(21)=4$. Radius=2.

Q112. Answer: (B) 74
Using α+β=12 and αβ=35, $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=12^2-2(35)=74$.

Q113. Answer: (C) 3
$\log_{10}(10\text{^}1)+\log_{10}(10\text{^}2)=1+2=3$.

Q114. Answer: (C) 18
For a 2×2 matrix, det=ad−bc=4×6−2×3=18.

Q115. Answer: (B) 7
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=4+5-2=7$.

Q116. Answer: (C) 5/6
Favourable outcomes: 2 to 6, i.e. 5 outcomes. Probability=5/6=5/6.

Q117. Answer: (B) 4
sin x=0 when $x=k\pi$. Here k=0,1,...,3; hence there are 4 solutions.

Q118. Answer: (C) 2
Here g=−2, f=−3, c=9. Radius$^2=g^2+f^2-c=4+9-(9)=4$. Radius=2.

Q119. Answer: (B) 16
$f'(x)=3x^2+4x-4$. Therefore $f'(2)=3\times4+4\times2-4=16$.

Q120. Answer: (D) 93
$S_n=a(r^n-1)/(r-1)=3\times(2\text{^}5-1)/(2-1)=93$.

QUICK ANSWER KEY

1. B	2. B	3. A	4. A	5. C	6. B
7. B	8. C	9. D	10. B	11. B	12. A
13. B	14. A	15. C	16. B	17. B	18. A
19. B	20. A	21. A	22. B	23. D	24. A
25. D	26. B	27. B	28. C	29. A	30. D
31. D	32. D	33. A	34. D	35. D	36. D
37. B	38. A	39. A	40. C	41. C	42. C
43. C	44. B	45. A	46. C	47. C	48. B
49. D	50. A	51. D	52. B	53. B	54. B
55. D	56. C	57. C	58. B	59. A	60. B
61. C	62. C	63. D	64. A	65. A	66. D
67. B	68. B	69. B	70. D	71. D	72. B
73. A	74. D	75. B	76. C	77. B	78. C
79. C	80. B	81. C	82. A	83. A	84. B
85. C	86. C	87. B	88. C	89. C	90. C
91. C	92. A	93. C	94. C	95. C	96. B
97. D	98. B	99. B	100. C	101. A	102. D
103. D	104. B	105. D	106. D	107. A	108. D
109. C	110. B	111. D	112. B	113. C	114. C
115. B	116. C	117. B	118. C	119. B	120. D