

Math Bank - 2

1. The value of $\cos^2 73^\circ + \cos^2 47^\circ + \cos 73^\circ \cos 47^\circ$ is
 - (a) $\frac{1}{4}$
 - (b) $-\frac{1}{4}$
 - (c) $\frac{3}{4}$
 - (d) none of these
2. Given $\frac{\pi}{2} < \alpha < \pi$, then the expression

$$\sqrt{\frac{1-\sin \alpha}{1+\sin \alpha}} + \sqrt{\frac{1+\sin \alpha}{1-\sin \alpha}} =$$
 - (a) $\frac{1}{\cos \alpha}$
 - (b) $-\frac{2}{\cos \alpha}$
 - (c) $\frac{2}{\cos \alpha}$
 - (d) none of these
3. The minimum value of the expression

$$\sin \alpha + \sin \beta + \sin \gamma,$$
 when α, β, γ are real numbers satisfying $\alpha + \beta + \gamma = \pi$ is
 - (a) -3
 - (b) negative
 - (c) positive
 - (d) zero
4. The expression $2^{\sin \theta} + 2^{-\cos \theta}$ is minimum when θ is equal to
 - (a) $2n\pi + \frac{\pi}{4}, n \in I$
 - (b) $2n\pi + \frac{7\pi}{4}, n \in I$
 - (c) $n\pi \pm \frac{\pi}{4}, n \in I$
 - (d) none of these
5. If α and β be the solutions of $a \cos \theta + b \sin \theta = c$, then
 - (a) $\sin \alpha + \sin \beta = \frac{2bc}{a^2 + b^2}$
 - (b) $\sin \alpha \sin \beta = \frac{c^2 - a^2}{a^2 + b^2}$
 - (c) $\sin \alpha + \sin \beta = \frac{2ac}{b^2 + c^2}$
 - (d) $\sin \alpha \cdot \sin \beta = \frac{a^2 - b^2}{b^2 + c^2}$
6. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{2 \cot \alpha + \frac{1}{\sin^2 \alpha}}$ is equal to
 - (a) $1 - \cot \alpha$
 - (b) $1 + \cot \alpha$
 - (c) $-1 + \cot \alpha$
 - (d) $-1 - \cot \alpha$
7. If A and B be acute positive angles satisfying

$$3 \sin^2 A + 2 \sin^2 B = 1 \text{ and } 3 \sin 2A - 2 \sin 2B = 0,$$
 then
 - (a) $B = \frac{\pi}{4} - \frac{A}{2}$
 - (b) $A = \frac{\pi}{4} - 2B$
 - (c) $B = \frac{\pi}{2} - \frac{A}{4}$
 - (d) $A = \frac{\pi}{4} - 2B$
8. The general solution of the equation

$$\tan \theta + \tan 4\theta + \tan 7\theta = \tan \theta \tan 4\theta \tan 7\theta$$
 is
 - (a) $\theta = \frac{n\pi}{4}$
 - (b) $\theta = \frac{n\pi}{12}$
 - (c) $\theta = \frac{n\pi}{6}$
 - (d) none of these
9. The expression $(1 + \tan x + \tan^2 x)(1 - \cot x + \cot^2 x)$ has the positive value for x , given by:
 - (a) $0 \leq x \leq \pi/2$
 - (b) $0 \leq x \leq \pi$
 - (c) for all $x \in R$
 - (d) $x \geq 0$
10. If $\sin 3\alpha = 4 \sin \alpha \sin(x + \alpha) \sin(x - \alpha)$, then $x =$
 - (a) $n\pi \pm \frac{\pi}{6}$
 - (b) $n\pi \pm \frac{\pi}{3}$
 - (c) $n\pi \pm \frac{\pi}{4}$
 - (d) $n\pi \pm \frac{\pi}{2}$
11. The equation $\sqrt{3} \sin x + \cos x = 4$ has
 - (a) only one solution
 - (b) two solutions
 - (c) infinitely many solution
 - (d) no solution
12. Let $f(x) = e^{\cos^{-1} \sin(x + \frac{\pi}{3})}$, then
 - (a) $f\left(\frac{8\pi}{9}\right) = e^{18}$
 - (b) $f\left(\frac{8\pi}{9}\right) = e^{\frac{13\pi}{18}}$
 - (c) $f\left(-\frac{7\pi}{4}\right) = e^{12}$
 - (d) $f\left(-\frac{7\pi}{4}\right) = e^{\frac{11\pi}{12}}$
13. If $a \leq \sin^{-1} x + \cos^{-1} x + \tan^{-1} x \leq b$, then
 - (a) $a = \frac{\pi}{4}, b = \frac{3\pi}{4}$
 - (b) $a = 0, b = \pi$
 - (c) $a = -\frac{\pi}{4}, b = \frac{3\pi}{4}$
 - (d) none of these
14. If $a = \sin(\cot^{-1} x)$ and $b = \cot(\sin^{-1} x)$ where $x > 0$, then

$$\frac{1}{x^2} - x^2 =$$
 - (a) $\frac{b^2}{a^2}$
 - (b) $\frac{a^2}{b^2}$
 - (c) $\frac{a^2 + 1}{b^2 - 1}$
 - (d) none of these
15. If $2 \sin^{-1} x - 3 \cos^{-1} x = 4$ then

$$2 \sin^{-1} x + 3 \cos^{-1} x$$
 equals

30. The area of triangle formed by the lines $y^2 - 9xy + 18x^2 = 0$ and $y = 9$ is
- (a) $-\frac{27}{4}$ (b) 0
(c) $\frac{9}{3}$ (d) 27
31. The equation $4x^2 + mxy - 3y^2 = 0$ represents, a pair of real and distinct lines if
- (a) $m \in \mathbb{R}$ (b) $m \in (3, 4)$
(c) $m \in (-3, 4)$ (d) $m > 4$
32. A circle of radius 5 touches the coordinate axes in the first quadrant. If the circle makes one complete roll on x -axis along the positive direction of x -axis, then its equation in the new position is
- (a) $x^2 + y^2 - 10(2\pi + 1)x - 10y + 100\pi^2 + 100\pi + 25 = 0$
(b) $x^2 + y^2 + 10(2\pi + 1)x - 10y + 100\pi^2 + 100\pi + 25 = 0$
(c) $x^2 + y^2 - 10(2\pi + 1)x + 10y + 100\pi^2 + 100\pi + 25 = 0$
(d) none of these
33. The two circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ touch each other if
- (a) $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c}$ (b) $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c^2}$
(c) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c}$ (d) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$
34. If the circle $x^2 + y^2 - 4x - 6y + k = 0$ does not touch or intersect the axes and the point $(2, 2)$ lies inside the circle, then
- (a) $4 < k < 9$ (b) $4 < k < 12$
(c) $9 < k < 12$ (d) none of these
35. If the line $3x + ay - 20 = 0$ cuts the circle $x^2 + y^2 = 25$ at real, distinct or coincident points, then a belongs to the interval
- (a) $[-\sqrt{7}, \sqrt{7}]$
(b) $(-\sqrt{7}, \sqrt{7})$
(c) $(-\infty - \sqrt{7}] \cup [\sqrt{7}, \infty)$
(d) none of these
36. The angle between the two tangents drawn from the point $(1, 4)$ to the parabola $y^2 = 12x$ is
- (a) $\tan^{-1}\left(\frac{1}{2}\right)$ (b) $\tan^{-1}\left(\frac{1}{3}\right)$
(c) $\tan^{-1}(2)$ (d) none of these
37. Equation of the parabola whose vertex is $(-3, -2)$, axis is horizontal and which passes through the point $(1, 2)$ is
- (a) $y^2 + 4y + 4x - 8 = 0$
(b) $y^2 + 4y - 4x + 8 = 0$
(c) $y^2 + 4y - 4x - 8 = 0$
(d) none of these
38. A ray of light is coming along the line which is parallel to y -axis and strikes a concave mirror whose intersection with the xy -plane is a parabola $(x - 4)^2 = 4(y + 2)$. After reflection, the ray must pass through the point
- (a) $(4, -1)$ (b) $(0, 1)$
(c) $(-4, 1)$ (d) none of these
39. The circle on focal radii of a parabola as diameter touches the
- (a) axis
(b) directrix
(c) tangent at the vertex
(d) none of these
40. The domain of the function $f(x) = \sqrt{\cos^{-1}\left(\frac{1-|x|}{2}\right)}$ is
- (a) $(-\infty, -3) \cup (3, \infty)$ (b) $[-3, 3]$
(c) $(-\infty, -3] \cup [3, \infty)$ (d) ϕ
41. The domain of the function $f(x) = \cos^{-1}\left(\frac{3}{4+2\sin x}\right)$ is
- (a) $\left[-\frac{\pi}{6} + 2n\pi, \frac{\pi}{6} + 2n\pi\right]$
(b) $\left(-\frac{\pi}{6} + 2n\pi, \frac{\pi}{6} + 2n\pi\right)$
(c) $\left(-\frac{\pi}{6} + 2n\pi, \frac{\pi}{6} + 2n\pi\right]$
(d) $\left[-\frac{\pi}{6} + 2n\pi, \frac{\pi}{6} + 2n\pi\right)$
42. The domain of the function $f(x) = \log\left[\frac{1}{x+\frac{1}{2}}\right] |x^2 - 5x + 6|$ is
- (a) $\left[\frac{3}{2}, 2\right) \cup (2, 3) \cup (3, \infty)$
(b) $\left[\frac{3}{2}, \infty\right)$
(c) $\left[\frac{1}{2}, \infty\right)$
(d) none of these
43. The domain of the function $f(x) = \log_3 [-(\log_3 x)^2 + 5 \log_3 x - 6]$ is
- (a) $(0, 9) \cup (27, \infty)$ (b) $[9, 27]$
(c) $(9, 27)$ (d) none of these
44. If $f(x), g(x)$ be differentiable functions and

$f(1) = g(1) = 2$ then

$\lim_{x \rightarrow 1} \frac{f(1)g(x) - f(x)g(1) - f(1) + g(1)}{g(x) - f(x)}$ is equal to

- (a) 0 (b) 1
(c) 2 (d) none of these

45. If $\lim_{x \rightarrow 0} \frac{\sin 2x + a \sin x}{x^3}$ be finite, then the value of a and the limit are given by

- (a) -2, 1 (b) -2, -1
(c) 2, 1 (d) 2, -1

46. $\lim_{x \rightarrow 5} \frac{x^2 - 9x + 20}{x - [x]} =$

- (a) 1 (b) 0
(c) does not exist (d) cannot be determined

47. $\lim_{x \rightarrow 0} \left(\frac{1 + \tan x}{1 + \sin x} \right)^{1/\sin x}$ is equal to

- (a) 0 (b) 1
(c) -1 (d) none of these

48. If $f(x) = \begin{cases} \frac{1 - \sin^2 x}{3 \cos^2 x}, & x < \frac{\pi}{2} \\ a, & x = \frac{\pi}{2} \\ \frac{b(1 - \sin x)}{(\pi - 2x)^2}, & x > \frac{\pi}{2} \end{cases}$. Then $f(x)$ is

continuous at $x = \frac{\pi}{2}$, if

- (a) $a = \frac{1}{3}, b = 2$ (b) $a = \frac{1}{3}, b = \frac{8}{3}$
(c) $a = \frac{2}{3}, b = \frac{8}{3}$ (d) none of these

49. The function $f(x) = \max. \{(1-x), (1+x), 2\}, x \in (-\infty, \infty)$, is

- (a) continuous at all points
(b) differentiable at all points
(c) differentiable at all points except at $x = 1$ and $x = -1$.
(d) continuous at all points except at $x = 1$ and $x = -1$, where it is discontinuous.

50. The number of points at which the function

$f(x) = \frac{1}{\log|x|}$ is discontinuous, is

- (a) 4 (b) 3
(c) 2 (d) 1

51. If $f(x) = |x - a| \phi(x)$, where $\phi(x)$ is continuous function and $\phi(0) = 0$, then

- (a) $f'(a^+) = \phi(a)$ (b) $f'(a^-) = -\phi(a)$
(c) $f'(a^+) = f'(a^-)$ (d) none of these

52. If $y = e^{ax} \sin bx$, then $\frac{d^2y}{dx^2} - 2a \frac{dy}{dx}$ is equal to

- (a) $-(a^2 + b^2)y$ (b) $(a^2 + b^2)y$
(c) $-y$ (d) none of these

53. If $y = x^{n-1} \log x$, then $x^2 y_2 + (3 - 2n)xy_1$ is equal to

- (a) $-(n-1)^2 y$ (b) $(n-1)^2 y$
(c) $-n^2 y$ (d) $n^2 y$

54. The derivative of $\tan^{-1} \frac{\sqrt{1+x^2} - 1}{x}$ w.r.t.

$\cos^{-1} \sqrt{\frac{1 + \sqrt{1+x^2}}{2\sqrt{1+x^2}}}$ is

- (a) 1 (b) -1
(c) $\frac{1}{2}$ (d) none of these

55. If $y = \cos^{-1} \left(\frac{2 \cos x - 3 \sin x}{\sqrt{13}} \right)$, then $\frac{dy}{dx}$ is equal to

- (a) 1 (b) 0
(c) constant ($\neq 1$) (d) none of these

56. The equation of the normal to the curve $y = (1+x)^y + \sin^{-1}(\sin^2 x)$ at $x = 0$ is

- (a) $x + y = 2$ (b) $x + y = 1$
(c) $x - y = 1$ (d) none of these

57. If the slope of the tangent to the curve $y = e^x \cos x$ is minimum at $x = a, 0 \leq a \leq 2\pi$, then the value of a is

- (a) 0 (b) π
(c) 2π (d) none of these

58. Let $f(x) = \int e^x (x-1)(x-2) dx$. Then f decreases in the interval

- (a) $(-\infty, -2)$ (b) $(-2, -1)$
(c) $(1, 2)$ (d) $(2, +\infty)$

59. The curve $y = ax^3 + bx^2 + cx + 5$ touches the x -axis at $A(-2, 0)$ and cuts the y -axis at a point B where its slope is 3. The values of a, b and c are

- (a) $a = \frac{1}{2}, b = -\frac{3}{4}, c = 3$

- (b) $a = -\frac{1}{2}, b = -\frac{3}{4}, c = 3$

- (c) $a = \frac{1}{2}, b = \frac{3}{4}, c = 3$

- (d) none of these

60. $\int e^{3 \log x} (x^4 + 1)^{-1} dx$ is equal to

- (a) $\frac{1}{4} \log(x^4 + 1) + C$
 (b) $-\log(x^4 + 1) + C$
 (c) $\log(x^4 + 1) + C$
 (d) none of these
61. $\int \log(x + \sqrt{x^2 + a^2}) dx$ is equal to
 (a) $x \log(x + \sqrt{x^2 + a^2}) + \sqrt{x^2 + a^2} + C$
 (b) $x \log(x + \sqrt{x^2 + a^2}) - 2\sqrt{x^2 + a^2} + C$
 (c) $x \log(x + \sqrt{x^2 + a^2}) - \sqrt{x^2 + a^2} + C$
 (d) none of these
62. $\int \frac{e^{\tan^{-1}x}}{(1+x^2)} (1+x+x^2) dx$ is equal to
 (a) $\frac{e^{\tan^{-1}x}}{1+x^2}$ (b) $e^{\tan^{-1}x} \cdot (1+x^2)$
 (c) $xe^{\tan^{-1}x}$ (d) none of these
63. If $\int \frac{dx}{\sqrt{2ax-x^2}} = (f \circ g)(x) + C$, then
 (a) $f(x) = \sin^{-1}x, g(x) = \frac{x+a}{a}$
 (b) $f(x) = \sin^{-1}x, g(x) = \frac{x-a}{a}$
 (c) $f(x) = \cos^{-1}x, g(x) = \frac{x-a}{a}$
 (d) $f(x) = \tan^{-1}x, g(x) = \frac{x-a}{a}$
64. $\int_0^{\infty} \left[\frac{2}{e^x} \right] dx$ (where $[\cdot]$ denotes the greatest integer function) equals
 (a) $\log_e 2$ (b) e^2
 (c) 0 (d) $\frac{2}{e}$
65. Given $\int_1^2 e^{x^2} dx = a$, the value of $\int_1^2 \sqrt{\ln(x)} dx$ is
 (a) $e^4 - e$ (b) $e^4 - a$
 (c) $2e^4 - a$ (d) $2e^4 - e - a$
66. $\int_0^3 [\sqrt{x}] dx$ is equal to
 (a) 1 (b) 2
 (c) -1 (d) -2
67. $\int_{-2}^1 [x+1] dx$ is equal to
 (a) 0 (b) 1
 (c) -1 (d) none of these
68. The general solution of the differential equation $y(x^2y + e^x) dx - e^x dy = 0$ is
 (a) $x^3y - 3e^x = cy$ (b) $x^3y + 3e^x = cy$
 (c) $y^3x - 3e^y = cx$ (d) $y^3x + 3e^y = cx$
69. The solution of the equation $\log \frac{dy}{dx} = 9x - xy + 6$, given that $y = 1$ when $x = 0$, is
 (a) $3e^{6y} = 2e^{9x-6} + 6e^6$ (b) $3e^{6y} = 2e^{9x+6} - 6e^6$
 (c) $3e^{6y} = 2e^{9x+6} + e^6$ (d) none of these
70. The order of the differential equation satisfying $\sqrt{1-x^4} + \sqrt{1-y^4} = a(x^2-y^2)$, is
 (a) 1 (b) 2
 (c) 3 (d) none of these
71. The particular solution of $\cos y dx + (1 + 2e^{-x}) \sin y dy = 0$, when $x = 0, y = \frac{\pi}{4}$ is
 (a) $e^x - 2 = 3\sqrt{2} \cos y$
 (b) $e^x + 2 = \sqrt{2} \cos y$
 (c) $e^x + 2 = 3\sqrt{2} \cos y$
 (d) none of these
72. If $\left| \frac{z-5i}{z+6i} \right| = 1$, then locus of z is
 (a) x -axis (b) y -axis
 (c) $x = 1$ (d) $y = 1$
73. If $z_r = \cos\left(\frac{\pi}{3^r}\right) + i \sin\left(\frac{\pi}{3^r}\right), r = 1, 2, 3, \dots$, then $z_1 z_2 z_3 \dots \infty =$
 (a) i (b) $-i$
 (c) 1 (d) -1
74. The solution of the equation $|z| - z = 1 + 2i$ is
 (a) $\frac{3}{2} - 2i$ (b) $\frac{3}{2} + 2i$
 (c) $2 - \frac{3}{2}i$ (d) none of these
75. The locus of the complex number z in the Argand plane if $\left| \frac{1-iz}{z-i} \right| = 1$, is
 (a) a circle (b) x -axis
 (c) y -axis (d) none of these

76. $\sqrt{-1 - \sqrt{-1 - \sqrt{-1 - \dots}}}$ to $\infty =$
 (a) 1 (b) -1
 (c) ω (d) ω^2
77. The maximum sum of the series
 $20 + 19\frac{1}{3} + 18\frac{2}{3} + 18 + \dots$ is
 (a) 310 (b) 290
 (c) 320 (d) none of these
78. The minimum number of terms from the beginning of
 the series $20 + 22\frac{2}{3} + 25\frac{1}{3} + \dots$, so that the sum may
 exceed 1568, is
 (a) 25 (b) 27
 (c) 28 (d) 29
79. A club consists of members whose ages are in A.P., the
 common difference being 3 months. If the youngest
 member of the club is just 7 years old and the sum of
 the ages of all the members is 250 years, then the number
 of members in the club are
 (a) 15 (b) 25
 (c) 20 (d) 30
80. If a, b, c are respectively the x th, y th and z th terms of a
 G.P., then
 $(y - z) \log a + (z - x) \log b + (x - y) \log c =$
 (a) 1 (b) -1
 (c) 0 (d) none of these
81. If r be the ratio of the roots of the equation
 $ax^2 + bx + c = 0$, then $\frac{(r+1)^2}{r} =$
 (a) $\frac{a^2}{bc}$ (b) $\frac{b^2}{ca}$
 (c) $\frac{c^2}{ab}$ (d) none of these
82. The value of k so that the equations $x^2 - x - 12 = 0$
 and $kx^2 + 10x + 3 = 0$ may have one root in common,
 is
 (a) $\frac{43}{16}$ (b) 3
 (c) -3 (d) $-\frac{43}{16}$
83. If the equations $ax^2 + bx + c = 0$ and $x^2 + 2x + 3 = 0$
 have a common root, then $a : b : c =$
 (a) 2 : 4 : 5 (b) 1 : 3 : 4
 (c) 1 : 2 : 3 (d) none of these
84. For the equation $|x^2| + |x| - 6 = 0$, the roots are
 (a) real and equal (b) real with sum 0
 (c) real with sum 1 (d) real with product 0
85. For $2 \leq r \leq n$, $\binom{n}{r} + 2\binom{n}{r-1} + \binom{n}{r-2} =$
 (a) $\binom{n+1}{r-1}$ (b) $2\binom{n+1}{r+1}$
 (c) $2\binom{n+2}{r}$ (d) $\binom{n+2}{r}$
86. The total number of 8 digits numbers which have all
 different digits is
 (a) 3265920 (b) 3265860
 (c) 3268620 (d) none of these
87. Three boys and three girls are to be seated around a
 table, in a circle. Among them, the boy X does not
 want any girl neighbour and the girl Y does not want
 any boy neighbour. The number of such arrangements
 possible is
 (a) 4 (b) 6
 (c) 8 (d) none of these
88. A telegraph has 5 arms and each arm is capable of 4
 distinct positions, including the position of rest. The
 total number of signals that can be made is
 (a) 473 (b) 1023
 (c) 1173 (d) none of these
89. The term independent of x in $(1+x)^m \left(1 + \frac{1}{x}\right)^n$ is
 (a) ${}^{m+n}C_m$ (b) ${}^{m+n}C_n$
 (c) ${}^{m+n}C_{m-n}$ (d) none of these
90. The coefficient of x^3 in the expansion of $(1-x+x^2)^6$ is
 (a) 50 (b) -50
 (c) 68 (d) none of these
91. The coefficient of x^4 in the expansion of
 $(1+x+x^2+x^3)^{11}$ is
 (a) 990 (b) 605
 (c) 810 (d) none of these
92. If $C_0, C_1, C_2, \dots, C_n$ are the coefficients of the expansion
 of $(1+x)^n$, then the value of $\sum_{k=0}^n \frac{C_k}{k+1}$ is
 (a) 0 (b) $\frac{2^n - 1}{n}$
 (c) $\frac{2^{n+1} - 1}{n+1}$ (d) none of these
93. The sum of the series $1 + \frac{3}{2!} + \frac{5}{4!} + \frac{7}{6!} + \dots \infty$ is
 (a) e (b) $2e$
 (c) $3e$ (d) none of these

94. The series $3\log 2 + \frac{1}{4} - \frac{1}{2}\left(\frac{1}{4}\right)^2 + \frac{1}{3}\left(\frac{1}{4}\right)^3 \dots$ is equal to
- (a) $\log 3$ (b) $\log 5$
(c) $\log 10$ (d) none of these
95. The value of $1 + \frac{1+a}{2!} + \frac{1+a+a^2}{3!} + \dots \infty$ is
- (a) $\frac{e-e^a}{a-1}$ (b) $\frac{e^a-e}{a-1}$
(c) $\frac{e^{a-1}-e}{a-1}$ (d) none of these
96. The sum of the series $\frac{1}{2 \cdot 3} + \frac{1}{4 \cdot 5} + \frac{1}{6 \cdot 7} + \dots$ is
- (a) $\log\left(\frac{e}{2}\right)$ (b) $\log\left(\frac{2}{3}\right)$
(c) $\frac{e}{2}$ (d) $\frac{2}{e}$
97. If A and B are two matrices such that $AB = B$ and $BA = A$, then $A^2 + B^2 =$
- (a) $2AB$ (b) $2BA$
(c) $A+B$ (d) AB
98. If A and B are square matrices of same order such that $(A+B)^2 = A^2 + B^2 + 2AB$, then
- (a) $AB = BA$ (b) $A = B$
(c) $A = B'$ (d) $A = -B$
99. If A, B are two $n \times n$ non-singular matrices, then
- (a) AB is non-singular
(b) AB is singular
(c) $(AB)^{-1} = A^{-1}B^{-1}$
(d) $(AB)^{-1}$ does not exist
100. The value of a for which the system of equations $ax + y + z = 0, x + ay + z = 0, x + y + z = 0$, possess non-zero solutions are given by
- (a) $1, 2$ (b) $1, -1$
(c) 1 (d) none of these

Answer keys

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|------------|------------|------------|------------|-----------|------------|
| 1. (c) | 2. (b) | 3. (c) | 4. (b) | 5. (a, b) | 6. (d) |
| 7. (a) | 8. (a, c) | 9. (c) | 10. (a) | 11. (d) | 12. (c) |
| 13. (b) | 14. (a) | 15. (b) | 16. (b) | 17. (d) | 18. (b) |
| 19. (a, d) | 20. (b) | 21. (a) | 22. (a) | 23. (b) | 24. (d) |
| 25. (d) | 26. (b) | 27. (d) | 28. (c) | 29. (c) | 30. (a) |
| 31. (b) | 32. (a) | 33. (c) | 34. (c) | 35. (c) | 36. (a) |
| 37. (c) | 38. (a) | 39. (c) | 40. (b) | 41. (a) | 42. (a) |
| 43. (c) | 44. (c) | 45. (b) | 46. (c) | 47. (b) | 48. (a, b) |
| 49. (c) | 50. (a) | 51. (c) | 52. (b) | 53. (a) | 54. (c) |
| 55. (b) | 56. (c) | 57. (a, d) | 58. (b, c) | 59. (a) | 60. (c) |
| 61. (a) | 62. (c) | 63. (b) | 64. (a) | 65. (d) | 66. (b) |
| 67. (a) | 68. (b) | 69. (c) | 70. (a) | 71. (c) | 72. (a) |
| 73. (a) | 74. (c, d) | 75. (b) | 76. (a) | 77. (d) | 78. (b) |
| 79. (c) | 80. (b) | 81. (b, d) | 82. (c) | 83. (b) | 84. (d) |
| 85. (a) | 86. (a) | 87. (b) | 88. (b) | 89. (b) | 90. (a) |
| 91. (c) | 92. (a) | 93. (c) | 94. (b) | 95. (a) | 96. (c) |
| 97. (a) | 98. (a) | 99. (c) | 100. (b) | | |