Marking Scheme for WBJEE 2026

Understanding the marking scheme is essential for efficient answering and attempting questions with a strategic mindset. Check marking scheme in the table provided below:

WBJEE Marking Scheme 2026		
Category	**Marks Distribution**	**Negative Marking**
Category I	1 mark	¼ mark
Category II	2 mark	½ mark
Category III	2 mark	No Negative Marking

Category-1

1) Let f(x) be a polynomial function satisfying the equation $\frac{1}{3}f(x).f\left(\frac{1}{x}\right)+\frac{8}{3}=f(x)+f\left(\frac{1}{x}\right)$ and f(2) = 7, then the value of f(3) will be:

A 8

B 12

C 14

D 10

2) The number of integers present in the range of $f(x) = \text{sgn}\left(\log_{10}\left(x^2+x+\frac{1}{2}\right)\right)$ is:

(Where sgn denotes the signum function)

A 2 B 0 C 1 D

MORE THAN 2

3) The number of integers in domain of definition of the function, $f(x) = \cos^{-1}\left[\frac{3x^2-7x+8}{1+x^2}\right]$, where [*] denotes the greatest integer function, is:

A 4

B 6

C 2

D 3

4) Match the following List.

List-I		List-II	
(I)	$\cot^{-1}(\tan(-37^\circ))$	(P)	143°
(II)	$\cos^{-1}(\cos(-233^\circ))$	(Q)	127°
(III)	$\sin\left(\frac{1}{2}\cos^{-1}\left(\frac{1}{9}\right)\right)$	(R)	$\frac{3}{4}$
(IV)	$\cos\left(\frac{1}{2}\text{arc}\cos\left(\frac{1}{8}\right)\right)$	(S)	$\frac{2}{3}$

(A) (I)→Q; (II)→P; (III)→R; (IV) →S

(B) (I)→P; (II)→P; (III)→S; (IV) →S

(C) (I)→Q; (II)→Q; (III)→S; (IV) →R

(D) (I)→P; (II)→Q; (III)→R; (IV) →R

5) Three numbers are in AP. If 8 is added to the first number, we get a GP with sum of the terms is equal to 26 . Then the common ratio of the GP when they are written in the ascending order, is

(A) 3 (B) $1/3$

(C) 2 (D) $1/2$

6) If S sum to 50 terms of $1+(2)(3)+4+(5)(6)+7+$ (8)(9) + ... then $S/9935$

A 3

B 2

C 6

D 4

7) The letters of the word SURITI are written in all possible orders and these words are written out as in a dictionary. Then the rank of the word SURITI is

(A) 236

(B) 245

(C) 307

(D) 315

8) A 5-digit number divisible by 3 is to be formed using the digits $0,1,2,3,$ 4 and 5 without repetition. The total number of ways in which this can be done is

(A) 216

(B) 600

(C) 240

(D) 3125

9) The number of ways of choosing a committee of two women and three men from five women and six men, if Mr. A refuses to serve on the committee if Mr. B is a member and Mr. B can only serve, if Ms. C is the member of the committee is?

(A) 60

(B) 84

(C) 124

(D) none of these

10) If the line $y = mx + 7\sqrt{3}$ is normal to the hyperbola $\frac{x^2}{24} - \frac{y^2}{18} = 1$, then a value of m is

(A) $\frac{3}{\sqrt{5}}$

(B) $\frac{\sqrt{15}}{2}$

(C) $\frac{2}{\sqrt{5}}$

(D) $\frac{\sqrt{5}}{2}$

11) The minimum value of $|z-3|+|z+5|$ is

(A) 1

(B) 4

(C) 6

(D) 8

12) $\frac{(-1+i\sqrt{3})^{15}}{(1-i)^{20}}+\frac{(-1-i\sqrt{3})^{15}}{(1+i)^{20}}$ is equal to

(A) 32

(B) 64

(C) -64

(D) None of these.

13) The four points of intersection of the lines $(2x-y+1)(x-2y+3)=0$ with the axes lies on a circle whose centre is at the point

(A) $(-7/4, 5/4)$

(B) $(3/4, 5/4)$

(C) $(9/4, 5/4)$

(D) $(0, 5/4)$

14) The centres of a set of circles each of radius 3, lie on the circle $x^2+y^2=25$. The locus of any point in the set is

(A) $4 \leq x^2+y^2 \leq 64$

(B) $x^2+y^2 \leq 25$

(C) $x^2+y^2 > 25$

15> A circle of radius r touches the parabola $y^2 = 4ax$ $(a > 0)$ at the vertex and the centre lies on the axis of the parabola. Further, the circle completely lies within the parabola. Then the largest possible value of r is:

(A) $2a$ (B) $3a$

(C) $4a$ (D) a

16> If chord BC subtends right angle at the vertex A of the parabola $y^2 = 4x$ with $AB = \sqrt{5}$ then the area of triangle ABC is

(A) 18 sq. units (B) 20 sq. units

(C) 15 sq. units (D) None of these

17> Tangent to the ellipse $\frac{x^2}{32} + \frac{y^2}{18} = 1$ having slope $\frac{-3}{4}$ meets the co-ordinate axes in A and B. Find the area of triangle AOB, where O is the origin.

(A) 12 sq. units (B) 8 sq. units

(C) 24 sq. units (D) 32 sq. units

18) If z_1, z_2, z_3 are the vertices of an equilateral triangle in the argand plane, then $\left(z_1^2+z_2^2+z_3^2\right)=k\left(z_1 z_2+z_2 z_3+z_3 z_1\right)$ is true for

(A) $k=1$ (B) $k=2$

(C) $k=3$ (D) $k=4$

19) The locus of the points representing the complex numbers z for which $|z|-2=|z-i|-|z+5i|=0$, is

(A) a circle with centre at the origin

(B) a straight line passing through the origin

(C) the single point $(0,-2)$

(D) None of these

20) $\lim_{x \rightarrow \infty} \frac{\sin^4 x-\sin^2 x+1}{\cos^4 x-\cos^2 x+1}$ is equal to

(A) 0

(B) 1

(C) $\frac{1}{3}$

(D) $\frac{1}{2}$

21) $\lim_{x \rightarrow 0} \frac{e^{\tan x}-e^x}{\tan x-x}$ is equal to:

(A) 2 (B) 1

(C) 3 (D) 4

22) The coefficient of $\frac{1}{x}$ in the expansion of $(1+x)^n\left(1+\frac{1}{x}\right)^n$ is

(A) $\frac{n!}{(n-1)!(n+1)!}$

(B) $\frac{(2n)!}{(n-1)!(n+1)!}$

(C) $\frac{(2n)!}{(2n-1)!(2n+1)!}$

(D) None of these

23) The coefficient of x^{53} in the following expansion $\sum_{m=0}^{100} {}^{100}C_m(x-3)^{100-m} \cdot 2^m$ is

(A) ${}^{100}C_{47}$

(B) ${}^{100}C_{53}$

(C) $-{}^{100}C_{53}$

(D) $-{}^{100}C_{100}$

24) The mean and the median of the following ten numbers in increasing order 10,22,26, $29, 34, x, 42, 67, 70, y$ are 42 and 35 respectively, then $\frac{y}{x}$ is equal to

(A) $\frac{7}{3}$

(B) $\frac{9}{4}$

(C) $\frac{7}{2}$

(D) $\frac{8}{3}$

25) In $\triangle ABC, A = \frac{2\pi}{3}, b - c = 3\sqrt{3}$ cm and area of $\triangle ABC = \frac{9\sqrt{3}}{2}$ cm^2, then $BC =$

(A) $6\sqrt{3}$ cm

(B) 9 cm

(C) 18 cm

(D) 27 cm

26) Domain of the function $\sqrt{2-x} - \frac{1}{\sqrt{9-x^2}}$ is

(a) $(-3, 2)$ (b) $[-3, 2]$ (c) $(-3, 2]$ (d) $[-3, 2)$

27) Domain of $f(x) = \log_{(2x-5)}(x^2 - 3x - 10)$

(a) $[5, \infty)$

(b) $(-\infty, 2) \cup (5, \infty)$

(c) $\left(\frac{5}{2}, 3\right)$

(d) None of these

0

28) If $f(x) = 2\sin^2\theta + 4\cos(x+\theta)\sin x \cdot \sin\theta + \cos(2x + 2\theta)$ then value of $f^2(x) + f^2\left(\frac{\pi}{4} - x\right)$ is

(*a*) 0 (*b*) 1 (*c*) –1 (*d*) x^2

29) Let $f(x) = ax^2 + bx + c$, where a, b, c are rational and $f : Z \to Z$, where Z is the set of integers. Then $a + b$ is

(*a*) A negative integer

(*b*) An integer

(*c*) Non-integral rational number

(*d*) None of these

30) If $0 < a, b < 1$, and $\tan^{-1} a + \tan^{-1} b = \frac{\pi}{4}$, then the value of

$$(a+b) - \left(\frac{a^2+b^2}{2}\right) + \left(\frac{a^3+b^3}{3}\right) - \left(\frac{a^4+b^4}{4}\right) + \ldots \text{ is}$$

(*a*) $\log_e 2$ (*b*) e

(*c*) $e^2 - 1$ (*d*) $\log_e\left(\frac{e}{2}\right)$

31> If $f(x)=\begin{cases} \dfrac{x-1}{2x^2-7x+5} & \text{for } x \neq 1 \\ -\dfrac{1}{3} & \text{for } x = 1 \end{cases}$, then $f'(1) =$

(a) –1/9 (b) –2/9 (c) –1/3 (d) 1/3

32> The function $f(x) = x^2 \sin\frac{1}{x}, x \neq 0,\ f(0) = 0$ at x = 0

(a) Is continuous but not differentiable

(b) Is discontinuous

(c) Is having continuous derivative

(d) Is continuous and differentiable

33> The function $y = |\sin x|$ is continuous for any x but it is not differentiable at

(a) $x = 0$ only (b) $x = \pi$ only

(c) $x = k\pi\ (k \in N)$ (d) $x = k\pi\ (k \in I)$ only

34> The position vector of a point at a distance of $3\sqrt{11}$ units from $\hat{i} - \hat{j} + 2\hat{k}$ on a line passing through the point $\hat{i} - \hat{j} + 2\hat{k}$ and parallel to vector $3\hat{i} + \hat{j} + \hat{k}$ is

(a) $10\hat{i} + 2\hat{j} - 5\hat{k}$ (b) $-8\hat{i} - 4\hat{j} - \hat{k}$

(c) $8\hat{i} + 4\hat{j} + \hat{k}$ (d) $-10\hat{i} - 2\hat{j} - 5\hat{k}$

35> If line $\vec{r} = (\hat{i} - 2\hat{j} - \hat{k}) + \lambda(2\hat{i} + \hat{j} + 2\hat{k})$ is parallel to the plane $\vec{r}.(3\hat{i} - 2\hat{j} - m\hat{k}) = 14$ then the value of m is

(a) 2 (b) –2

(c) 0 (d) can not be predicted with these informations

36> If $\vec{a} = \vec{b} + \vec{c}, \vec{b} \times \vec{d} = \vec{0}$ and $\vec{c} \cdot \vec{d} = \vec{0}$, then $\dfrac{\vec{d} \times (\vec{a} \times \vec{d})}{\vec{d}^2}$ is equal to

(a) $\vec{a}$ (b) $\vec{b}$

(c) $\vec{c}$ (d) $\vec{d}$

37> The point of intersection of lines

$L_1 : (1+\lambda)\hat{i} + (2+2\lambda)\hat{j} + (3+3\lambda)\hat{k},\ \lambda \in R$

$L_2 : (3+2\mu)\hat{i} + (4+2\mu)\hat{j} + (1-2\mu)\hat{k},\ \mu \in R$ is

(a) $(-1, 2, 3)$ (b) $(1, 2, 3)$

(c) $(-2, 3, 4)$ (d) $(3, 4, -1)$

38) $\int \frac{dx}{\cos x - \sin x}$ is equal to

(a) $\frac{1}{\sqrt{2}} ln \left| \tan\left(\frac{x}{2} - \frac{3\pi}{8}\right) \right| + c$

(b) $\frac{1}{\sqrt{2}} ln \left| \cot\left(\frac{x}{2}\right) \right| + c$

(c) $\frac{1}{\sqrt{2}} ln \left| \cot\left(\frac{x}{2} - \frac{3\pi}{8}\right) \right| + c$

(d) $\frac{1}{\sqrt{2}} ln \left| \tan\left(\frac{x}{2} + \frac{3}{8}\right) \right| + c$

39) $\int \frac{1}{\cos^6 x + \sin^6 x} dx$ is equal to

(a) $\tan^{-1}(\tan x + \cot x) + c$

(b) $-\tan^{-1}(\tan x + \cot x) + c$

(c) $\tan^{-1}(\tan x - \cot x) + c$

(d) $-\tan^{-1}(\tan x - \cot x) + c$

40> If $\int_{\ell n 2}^{x} \frac{dx}{\sqrt{e^x - 1}} = \frac{\pi}{6}$, then x =

(a) 4 (b) $\ell n 8$ (c) $\ell n 4$ (d) $\ell n 2$

41> $\int_{5/2}^{5} \frac{\sqrt{(25-x^2)^3}}{x^4} dx$ equals to

(a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$

42> The area bounded by the curve $f(x) = x + \sin x$ and its inverse function between the ordinates $x = 0$ and $x = 2\pi$, is

(a) 4π sq. units (b) 8π sq. units

(c) 4 sq. units (d) 8 sq. units

43> The area of the region containing the points satisfying $|y| + 1/2 \le e^{-|x|}$ and max $(|x|, |y|) \le 2$, is

(a) 2 + ln 4 sq. unit (b) ln $(e^2/4)$ sq. unit

(c) 2 + ln 4 sq. unit (d) ln $(e^2.4)$ sq. unit

44) Let for a function $f(x)$, $h(x) = (f(x))^2 + (f(x))^3$ for every real number x. Then

(a) h is increasing whenever f is constant

(b) h is increasing whenever f is decreasing

(c) h is decreasing whenever f is increasing

(d) None of above.

45) Let $g(x) = a_0 + a_1x + a_2x^2 + a_3x^3$ and $f(x) = \sqrt{g(x)}$ and $f(x)$ has its non-zero local minimum and maximum values at -3 and 3 respectively. If $a_3 \in$ the domain of the function $h(x) = \sin^{-1}\left(\frac{1+x^2}{2x}\right)$. The value of a_0 is

(a) Equal to 50

(b) Greater than 54

(c) Less than 54

(d) Less than 50

46) A ray of light is sent through the point $P(1, 2, 3)$ and is reflected on the XY plane. If the reflected ray passes through the point $Q(3, 2, 5)$ then the equation of the reflected ray is

(a) $\frac{x-3}{1}=\frac{y-2}{0}=\frac{z-5}{1}$

(b) $\frac{x-3}{1}=\frac{y-2}{0}=\frac{z-5}{-4}$

(c) $\frac{x-3}{1}=\frac{y-2}{0}=\frac{z-5}{4}$

(d) $\frac{x-1}{1}=\frac{y-2}{0}=\frac{z-3}{4}$

47) The lines $\frac{x-1}{3}=\frac{y-1}{-1}=\frac{z+1}{0}$ and $\frac{x-4}{2}=\frac{y+0}{0}=\frac{z+1}{3}$

(a) do not intersect

(b) intersect

(c) intersect at $(4, 0, 4)$

(d) Intersect at $(1, 1, -1)$

48) A bag contains four tickets marked with numbers 112, 121, 211, 222. One ticket is drawn at random from the bag. Let $E_i (i = 1, 2, 3)$ denote the event that i^{th} digit on the selected ticket is 2, then which of the following is not correct?

(a) E_1 and E_2 are independent

(b) E_2 and E_3 are independent

(c) E_3 and E_1 are independent

(d) E_1, E_2 and E_3 are independent

49) Three ordinary and fair dice are rolled simultaneously. The probability of the sum of outcomes being atleast equal to 8, is equal to

(a) $\frac{81}{108}$ (b) $\frac{27}{216}$ (c) $\frac{81}{216}$ (d) $\frac{181}{216}$

50) Let $\Delta = \begin{vmatrix} -bc & b^2+bc & c^2+bc \\ a^2+ac & -ac & c^2+ac \\ a^2+ab & b^2+ab & -ab \end{vmatrix}$ and the equation

$px^3 + qx^2 + rx + s = 0$ has roots a, b, c, where $a, b, c \in R^+$.

The value of Δ is

(a) r^2/p^2 (b) r^3/p^3

(c) $-s/p$ (d) None of these

— x —

Category-2

51) For any integers $x_1, x_2, \ldots, x_n$ and positive integers $k_1, k_2, \ldots, k_n$,

the determinant $\begin{vmatrix} x_1^{k_1} & x_2^{k_1} & \ldots & x_n^{k_1} \\ x_1^{k_2} & x_2^{k_2} & \ldots & x_n^{k_2} \\ \vdots & \vdots & \vdots & \vdots \\ x_1^{k_n} & x_2^{k_n} & \ldots & x_n^{k_n} \end{vmatrix}$ is

(*a*) divisible by $n!$
(*b*) divisible by $(n+1)!$
(*c*) 0
(*d*) divisible by $(n+2)!$

52) The equation $(x^2+3x+4)^2+3(x^2+3x+4)+4=x$ has

(A) All its solution real but not all positive
(B) only two of its solutions real
(C) two of its solutions positive and two negative
(D) none of solutions real

53) The number of 4th order matrices with elements $\{-3, -2, -1, 0, 1, 2, 3\}$ such that matrix is either symmetric or skew symmetric

(*a*) 7^{16}
(*b*) $7^{10}+7^6+1$
(*c*) $7^{10}+7^6-1$
(*d*) None of these

54) If $f(x) = \cot^{-1} x : R^{+} \to \left(0, \frac{\pi}{2}\right)$ and $g(x) = 2x - x^2 : R \to R$.

Then the range of the function $f(g(x))$ wherever define is

(a) $\left(0, \frac{\pi}{2}\right)$

(b) $\left(0, \frac{\pi}{4}\right)$

(c) $\left[\frac{\pi}{4}, \frac{\pi}{2}\right)$

(d) $\left\{\frac{\pi}{4}\right\}$

55) The value of $\int \left\{ ln(1+\sin x) + x\tan\left(\frac{\pi}{4} - \frac{x}{2}\right)\right\} dx$ is equal to

(a) $x\, ln\,(1 + \sin x) + C$ (b) $ln\,(1 + \sin x) + C$

(c) $-x\, ln\,(1 + \sin x) + C$ (d) $ln\,(1 - \sin x) + C$

56) The general solution of

$\left(\frac{1}{x} - \frac{y^2}{(x-y)^2}\right)dx + \left(\frac{x^2}{(x-y)^2} - \frac{1}{y}\right)dy = 0$ is

(a) $ln\left(\frac{x}{y}\right) + \frac{xy}{x-y} = c$ (b) $\frac{y+x}{xy} - \frac{xy}{x+y} = c$

(c) $\frac{y-x}{xy} - \frac{xy}{x+y} = c$ (d) $\frac{y+x}{xy} - \frac{2xy}{x+y} = c$

57) Area enclosed by the curve $y = (x^2 + 2x)e^{-x}$ and the positive x-axis is

(A) 1

(B) 2

(C) 4

(D) 6

58) Area of region bounded by $x = 0$, $y = 0$, $x = 2$, $y = 2$, $y \leq e^x$ & $y \geq \ln x$ is

(A) $6 - 4 \ln 2$

(B) $4 \ln 2 - 2$

(C) $2 \ln 2 - 4$

(D) $6 - 2 \ln 2$

59) Let the mean and the variance of 5 observations x_1, x_2, x_3, x_4, x_5 be $\frac{24}{5}$ and $\frac{194}{25}$ respectively. If the mean and variance of the first 4 observation are $\frac{7}{2}$ and a respectively, then $(4a + x_5)$ is equal to:

(A) 13

(B) 15

(C) 17

(D) 18

60) Consider the complex numbers z_1 and z_2 satisfying the relation $|z_1 + z_2|^2 = |z_1|^2 + |z_2|^2$. Complex number z_1/z_2 is

(A) purely real

(B) purely imaginary

(C) zero

(D) none of these

61) Number of solution of the equation $\left(x^2 - 5|x| + 5\right)^{x^2 - 11|x| + 30} = 1$ is

(A) 12 (B) 14

(C) 7 (D) 2

62) If a denotes the number of permutations of $x + 2$ things taken all at a time, b the number of permutations of x things taken 11 at a time and c the number of permutations of $x-11$ things taken all at a time such that $a = 182\ bc$, then the value of x is

(A) 15
(B) 12
(C) 10
(D) 18

63) The equation of chord of the circle $x^2 + y^2 - 6x + 10y - 9 = 0$, which is bisected at $(-2, 4)$ must be

(a) $5x + 9y = 36$
(b) $5x + 9y = 46$
(c) $5x - 9y = 36$
(d) $5x - 9y = -46$

64) The point (-2m, m+1) is an interior point of the smaller region bounded by the circle $x^2 + y^2 = 4$ and the parabola $y^2 = 4x$. Then m belongs to the interval

(a) $-5-2\sqrt{6} < m < 1$
(b) $0 < m < 4$
(c) $-1 < m < \frac{3}{5}$
(d) $-1 < m < -5+2\sqrt{6}$

65) Triangles are formed with vertices of a regular polygon of 20 sides. The probability that no side of the polygon is a side of the triangle is $\frac{\lambda}{57}$ Then $\frac{\lambda}{40}$ is _____

(a) 2 (b) 1

(c) 7 (d) 12

Category-3

66) If $f(x) = 3(2x+3)^{2/3} + 2x + 3$, then

(A) $f(x)$ is continuous but not differentiable at $x = -3/2$

(B) $f(x)$ is differentiable at $x = 0$

(C) $f(x)$ is continuous at $x = 0$

(D) $f(x)$ is differentiable but not continuous at $x = -3/2$

67) If $f(x) = \begin{cases} \dfrac{x \cdot \ln(\cos x)}{\ln(1+x^2)}, & x \neq 0 \\ 0, & x = 0 \end{cases}$, then

(A) f is continuous at $x = 0$

(B) f is continuous at $x = 0$ but not differentiable at $x = 0$

(C) f is differentiable at $x = 0$

(D) f is not continuous at $x = 0$

68) Let $f(x) = \sin^{-1}\left(\dfrac{9-x^2}{9+x^2}\right) + \cos^{-1}\left(\dfrac{6x}{9+x^2}\right)$, then

(*a*) Total number of local maximum of $f(x)$ in $(-6, 6)$ are 3.

(*b*) $\int_{-3}^{3} f(x)dx = 3\pi + 6\ln 2$

(*c*) Total number of local minimum of $f(x)$ in $(-6, 6)$ are 3.

(*d*) Number of points where $f(x)$ is non differentiable in $(-6, 6)$ are 3.

69) There are n faculty members in a university. The faculty assembly consists of r members. Out of r assembly members k of them are selected for senate. The number of ways of selecting assembly members and senate is x. Then all possible values of x are.

(a) $n_{c_3}.n_{c_k}$ (b) $n_{c_r}+n_{c_k}$

(c) $n_{c_r}r_{c_k}$ (d) $n_{c_k}n-k_{c_{r-k}}$

70) A, B are two events of a random experiment such that $P(\overline{A})=0.3, P(B)=0.4$ and $P(A\cap\overline{B})=0.5$ Then

(a) $P(A\cup B)=0.9$ (b) $P(A\cap\overline{A})=0.2$

(c) $P(\overline{A}\cup\overline{B})=0.8$ (d) $P\left(\overline{A}/_{A\cup\overline{B}}\right)=0.25$

71) Let T be the triangle with vertices $(0, 0)$, $(0, c^2)$ and (c, c^2) and let R be the region between $y = cx$ and $y = x^2$ where $c > 0$ then

(a) Area $(R)=\frac{c^3}{6}$ (b) Area of $R=\frac{c^3}{3}$

(c) $\lim_{c\to 0^+}\frac{\text{Area}(T)}{\text{Area}(R)}=3$ (d) $\lim_{c\to 0^+}\frac{\text{Area}(T)}{\text{Area}(R)}=\frac{3}{2}$

72) The angle at which the curve $y = ke^{kx}$ intersects the y-axis is-

(a) $\tan^{-1}k^2$

(b) $\cot^{-1}(k^2)$

(c) $\sin^{-1}\left(\frac{1}{\sqrt{1+k^4}}\right)$

(d) $\sec^{-1}\left(\sqrt{1+k^4}\right)$

73) $h(x) = 3f\left(\frac{x^2}{3}\right) + f\left(3 - x^2\right) \forall x \in (-3, 4)$, where $f''(x) > 0 \forall x \in (-3, 4)$, then $h(x)$ is

(a) Increasing in $\left(\frac{3}{2}, 4\right)$

(b) Increasing in $\left(-\frac{3}{2}, 0\right)$

(c) Decreasing in $\left(-3, -\frac{3}{2}\right)$

(d) Decreasing in $\left(0, \frac{3}{2}\right)$

74) Let a be a real number and $\vec{\alpha} = \hat{i} + 2\hat{j}, \vec{\beta} = 2\hat{i} + a\hat{j} + 10\hat{k}$, $\vec{\gamma} = 12\hat{i} + 20\hat{j} + a\hat{k}$ be three vectors, then the system of vectors are linearly independent for:

(*a*) $a > 0$ (*b*) $a < 0$

(*c*) $a = 0$ (*d*) No value of a

75) Two perpendicular unit vectors $\vec{a}$ and $\vec{b}$ are such that $[\vec{r}\ \vec{a}\ \vec{b}] = \frac{5}{4}, \vec{r} \cdot (3\vec{a} + 2\vec{b}) = 0$ and $\int_{-2\vec{r}\cdot\vec{a}}^{-4/3\vec{r}\cdot\vec{b}} \frac{x+1}{x^2+1} dx = \frac{\pi}{2}$. Which of the following is(are) correct?

(*a*) $|\vec{r}|^2 = \frac{19}{8}$ (*b*) $|\vec{r}| = \frac{7}{4}$

(*c*) $\vec{r} = \frac{\vec{a}}{2} - \frac{3\vec{b}}{4} + \frac{5}{4}(\vec{a} \times \vec{b})$ (*d*) $\vec{r} = \frac{-\vec{a}}{2} + \frac{3\vec{b}}{2} + \frac{5}{4}(\vec{a} \times \vec{b})$

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