MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

DIRECTION COSINES AND DIRECTION RATIOS

Solved Examples

1. If A, B, C are the points (0, 4, 1), (2, 3, -1), (4, 5, 0) respectively, then angle between $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$ is

A. $\pi/6$

B. $\pi/3$

C. $\pi/2$

D. $\pi/4$

Answer: C

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2. The foot of the perpendicular from (1, 2, 3) to the line joining the points (6, 7, 7) and (9, 9, 5) is

A. (5, 3, 9)

B. (3, 5, 9)

C. (3, 9, 5)

D. (3, 9, 9)

Answer: B

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3. If the line joining the points (-1, 2, 3), (2, -1, 4) is perpendicular to the line joining the points (x, -2, 4), (1, 2, 3) then x =

A. 3

B. 10

C. $-3/10$

D. $-10/3$

Answer: D

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4. If the d.c.'s (l, m, n) of two lines are connected by the relations $l+m+n=0$ and $2mn+3\ln-5lm=0$ then the angle between the lines is

A. $\pi/4$

B. $\pi/3$

C. $\pi/6$

D. $\pi/2$

Answer: D

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5. If A (4, 3, 5), B (6, 4, 3), C (2, -1, 4), D (0, 1, 5) then the projection of $\overline{AB}$ on $\overline{CD}$ is

A. 0

B. $3/4$

C. $-4/3$

D. $-3/4$

Answer: C

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6. If α, β, γ are respectively the acute angles made by any line with the coordinate axes then

A. $\alpha + \beta + \gamma = 90^\circ$

B. $\alpha + \beta + \gamma = 360^\circ$

C. $0 < \alpha + \beta + \gamma < 270^\circ$

D. $\alpha + \beta + \gamma = 180^\circ$

Answer: C

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7. If the feet of the perpendiculars from (3, 4, 5) to the coordinate axes are A, B, C and the angle between AB and AC is $\cos^{-1}\left(\frac{9}{a}\right)$ then a =

A. $5\sqrt{34}$

B. $3\sqrt{34}$

C. $\sqrt{34}$

D. 25

Answer: A

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8. If (2, 5, 1) and (9, 10, 5) are the ends of a diagonal of a rectangular parallelopiped whose faces are parallel to the coordinate planes, then the lengths of edges are

A. 7, 5, 4

B. 17, 4, 5

C. 14, 5, 7

D. 4, 7, 15

Answer: A

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9. If a, b, C are direction ratios of line which lies 2 and 10 and such that (i) the sum of a, b, c is 19 (ii) a, b, 11 are in arithmetic progression (iii) a, c, 27 are in geometric progression then the values of a, b, c are

A. 3, 6, 10

B. 3, 7, 9

C. 5, 6, 7

D. 4, 6, 9

Answer: B

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Exercise 1

1. If OP = 21 and d.c. 's of $\overrightarrow{OP}$ are $\left(\frac{2}{7}, \frac{6}{7}, -\frac{3}{7}\right)$ then P =

A. (6, -12, 4)

B. (6, 18, -9)

C. (3/2, -6, 2)

D. (5, -10, 6)

Answer:

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2. If P = (-2, 3, 6) then the d.c.'s of $\overrightarrow{OP}$ are

A. $\left(\frac{3}{13}, \frac{4}{13}, -\frac{12}{13}\right)$

B. (6, 6, -3)

C. $\left(-\frac{2}{7}, \frac{3}{7}, \frac{6}{7}\right)$

D. $(2, 2, -1)$

Answer:

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3. The direction cosines of the line passing through P(2, 3, -1) and the origin are

A. $\left(\frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}, \frac{1}{\sqrt{14}}\right)$

B. $\left(\frac{2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{1}{\sqrt{14}}\right)$

C. $\left(\frac{-2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{1}{\sqrt{14}}\right)$

D. $\left(\frac{2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{-1}{\sqrt{14}}\right)$

Answer:

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4. If a line makes anles $\pi/3, \pi/4$ with the positive x-axis and y-axis then the angle made by the line with positive z-axis is

A. $\pi/2$

B. $\pi/3$

C. $\pi/4$

D. $5\pi/12$

Answer:

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5. If a line makes angles $60^\circ, 60^\circ$ with the positive x-axis and y-axis then the angle made by the line with positive z-axis is

A. 0

B. 45° or 135°

C. 60° or 120°

D. 90°

Answer:

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6. If a line makes an angle of $\pi/4$with the positive directions of each of x-axis and y-axis, then the angle that the line makes with the positive direction of the z-axis is

A. $\pi/6$

B. $\pi/3$

C. $\pi/4$

D. $\pi/2$

Answer:

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7. if the angles made by a straight line with the coordinate axes are $\alpha, \frac{\pi}{2} - \alpha, \beta$ then $\beta =$

A. 0

B. $\frac{\pi}{6}$

C. $\frac{\pi}{2}$

D. π

Answer:

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8. If α, β, γ are the angles made by a line with the positive directions of the coordinate axes, then $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A. 0

B. 1

C. 2

D. $\sqrt{2}$

Answer:

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9. If a line in the space makes angles $\alpha, \beta, \text{ and } \gamma$ with the coordinatess axes, then

$\cos 2\alpha + \cos 2\beta + \cos 2\gamma + \sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A. -1

B. 0

C. 1

D. 2

Answer:

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10. A line makes the same angle θ, with each of the x and z axis. If the angle β, which it makes with y-axis, is such that $\sin^2\beta = 3\sin^2\theta$, then $\cos^2\theta =$

A. $2/3$

B. $2/5$

C. $3/5$

D. $1/5$

Answer:

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11. A line AB in three-dimensional space makes angles 45° and 120° with the positive x-axis and the positive y-axis respectively. If AB makes an acute angle θ with the positive z-axis, then θ equals

A. 30°

B. 45°

C. 60°

D. 75°

Answer:

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12. A straight line is equally inclined to all the three coorinate axes. Then an angle made by the line with the y-axis is

A. $\cos^{-1}\left(\frac{1}{3}\right)$

B. $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

C. $\cos^{-1}\left(\frac{2}{\sqrt{3}}\right)$

D. $\frac{\pi}{4}$

Answer:

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13. The number of lines which are equally inclined to the coordinate axes is

A. 2

B. 4

C. 6

D. 8

Answer:

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14. The d.c.'s of a line which is equally inclined to the coordinate axes are

A. $\left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right)$

B. $\left(\frac{1}{3}, \frac{2}{3}, \frac{2}{3}\right)$

C. $\left(\frac{2}{7}, \frac{3}{7}, \frac{6}{7}\right)$

D. $\left(\frac{3}{13}, \frac{4}{13}, \frac{12}{13}\right)$

Answer:

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15. If the d.r.'s of a line are (3, -4, 12) then d.c.'s of the line are

A. $\left(\frac{4}{3}, \frac{2}{3}, -\frac{4}{3}\right)$

B. $\left(\frac{2}{3}, \frac{1}{3}, -\frac{2}{3}\right)$

C. $\left(\frac{2}{6}, \frac{1}{6}, -\frac{2}{6}\right)$

D. $\left(\frac{3}{13}, \frac{-4}{13}, \frac{12}{13}\right)$

Answer:

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16. The d.c.'s of the line joining the points A(4, 3, 1), B(-2, 1, -2) are

A. $\left(\frac{2}{7}, -\frac{3}{7}, -\frac{6}{7}\right)$

B. $\left(\frac{6}{7}, \frac{2}{7}, \frac{3}{7}\right)$

C. $\left(-\frac{2}{7}, -\frac{3}{7}, \frac{6}{7}\right)$

D. $\left(\frac{2}{7}, \frac{3}{7}, -\frac{6}{7}\right)$

Answer:

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17. If $(l_1, m_1, n_1), (l_2, m_2, n_2)$ are d.c's of two lines then find the value of $(l_1m_2 - l_2m_1)^2 + (m_1n_2 - n_1m_2)^2 + (n_1l_2 - n_2l_1)^2 + (l_1l_2 + m_1m_2 + n_1$

A. 0

B. 1

C. 2

D. 4

Answer:

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18. If (2, 1, -1) and (1, -1, -1) are direction ratios of two lines, then the direction cosines of a line perpendicular to both the lines are

A. $\left(\frac{1}{3}, -\frac{1}{3}, \frac{2}{3}\right)$

B. $\left(\frac{2}{3}, -\frac{1}{3}, \frac{2}{3}\right)$

C. $\left(-\frac{2}{3}, -\frac{1}{3}, \frac{2}{3}\right)$

D. $\left(\frac{2}{\sqrt{14}}, -\frac{1}{\sqrt{14}}, \frac{3}{\sqrt{14}}\right)$

Answer:

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19. IF the d.r.'s of $\overleftrightarrow{OA}, \overleftrightarrow{OB}$ are (1, -2, -1), (3, -2, 3) then the d.c.'s of the normal to the plane $\overleftrightarrow{AOB}$ are

A. $\left(\frac{4}{\sqrt{29}}, \frac{3}{\sqrt{29}}, -\frac{2}{\sqrt{29}}\right)$

B. $\left(\frac{11}{\sqrt{171}}, \frac{7}{\sqrt{171}}, \frac{1}{\sqrt{17}}\right)$

C. $\left(\frac{3}{29}, -\frac{2}{9}, \frac{4}{29}\right)$

D. $\left(\frac{3}{\sqrt{29}}, -\frac{2}{\sqrt{29}}, \frac{4}{\sqrt{29}}\right)$

Answer:

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20. The direction ratios of two lines AB, AC are 1, -1, -1 and 2, -1, 1. The direction ratios of the normal to the plane ABC are

A. 2, 3, -1

B. 2, 2, 1

C. 3, 2, -1

D. $-1, 2, 3$

Answer:

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21. If $(a_1, b_1, c_1), (a_2, b_2, c_2)$ are d.r.'s of two perpendicular lines then

A. $a_1a_2 = b_1b_2 = c_1c_2$

B. $a_1a_2 + b_1b_2 + c_1c_2 = 0$

C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

D. $a_1a_2 + b_1b_2 = c_1c_2$

Answer:

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22. If $(a_1, b_1, c_1), (a_2, b_2, c_2)$ are d.r.'s of two perpendicular lines then

A. $a_1a_2 = b_1b_2 = c_1c_2$

B. $a_1a_2 + b_1b_2 + c_1c_2 = 0$

C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

D. $a_1a_2 + b_1b_2 = c_1c_2$

Answer:

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23. If the direction cosines of any two lines are (-2/3, 1/3, 2/3), (3/5, 4/5, 0) respectively, then the angle between those two lines is

A. $\cos^{-1}\left(\frac{1}{7}\right)$

B. $\cos^{-1}\left(\frac{2}{15}\right)$

C. $\cos^{-1}\left(\frac{5}{7}\right)$

D. $\cos^{-1}\left(\frac{10}{7}\right)$

Answer:

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24. The angle between the lines whose direction cosines are $\left(\sqrt{3}/4, 1/4, \sqrt{3}/2\right)$ and $\left(\sqrt{3}/4, 1/4, -\sqrt{3}/2\right)$, is

A. π

B. $\pi/2$

C. $\pi/3$

D. $\pi/4$

Answer:

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25. If P(2, 3, -6), Q(3, -4, 5) are two points, then $\angle POQ$ is

A. $\cos^{-1}\left(\frac{18\sqrt{2}}{35}\right)$

B. $\cos^{-1}\left(\frac{81}{\sqrt{98}\sqrt{73}}\right)$

C. $\cos^{-1}\left(\frac{5}{7}\right)$

D. $\cos^{-1}\left(\frac{10}{7}\right)$

Answer:

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26. If P = (0, 1, 2), Q = (4, -2, 1), O = (0, 0, 0) then $\angle POQ =$

A. $\pi/6$

B. $\pi/4$

C. $\pi / 3$

D. $\pi / 2$

Answer:

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27. The cosine of the angle A of the triangle with vertices A(1, -1, 2), B(6, 11, 2), C(1, 2, 6) is

A. $\frac{63}{65}$

B. $\frac{36}{65}$

C. $\frac{16}{65}$

D. $\frac{13}{64}$

Answer:

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28. The angle between the lines passing through the points (8, 2, 0), (4, 6, -7) ; (-3, 1, 2), (-9, -2, 4) is

A. $\cos^{-1}(2/63)$

B. $\cos^{-1}(20/63)$

C. $\pi/2$

D. $\pi/5$

Answer:

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29. The angle between the line passing through the points (3, 1, -2) and (4, 0, -4) and the line passing through the points (4, -3, 3) and (6, -2, 2) is

A. $\cos^{-1}(2/63)$

B. $\cos^{-1}(20/63)$

C. $\pi/3$

D. $\pi/5$

Answer:

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30. If A(3, 4, 5), B(4, 6, 3), C(-1, 2, 4) and D(1, 0, 5) are such that the angle between the lines $\overline{DC}$ and $\overline{AB}$ is θ then $\cos\theta =$

A. $\frac{2}{9}$

B. $\frac{4}{9}$

C. $\frac{5}{9}$

D. $\frac{7}{9}$

Answer:

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31. If the d.r.'s of two lines are (1, -1, 0) and (1, -2, 1) then the angle between them is

A. 30°

B. 45°

C. 60°

D. 90°

Answer:

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32. If the line joining the points (k, 1, 2), (3, 4, 6) is parallel to the line joining the points (-4, 3, -6), (5, 12, l) then (k, l) =

A. (-2, 7)

B. (0, 6)

C. (0, -6)

D. (2, -7)

Answer:

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33. If the line joining the points A(4, 1, 2), B(5, x, 0) is parallel to the line joining the points P(2, 1, 1), Q(3, 3, -1) then x =

A. $1/2$

B. 3

C. 2

D. $-3/2$

Answer:

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34. If the d.r.'s of two lines are (x, 3, 5) and (2, -1, 2) and if the angle between those lines is 45°, then the value of x is

A. 4

B. 5

C. 2

D. 1

Answer:

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35. If the line joining the points (2, 3, 4), (0, 1, 2) is perpendicular to the line joining the points (x, 0, 4), (7, -4, 3) then x =

A. 2

B. 10

C. $-3/10$

D. $-10/3$

Answer:

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36. If O is the origin and P = (1, -2, 1) and $OP \perp OQ$, then Q =

A. $(4, 3, 2)$

B. $(3, 2, 4)$

C. $(2, 3, 4)$

D. $(1, -2, 3)$

Answer:

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37. If the d.c. 's (l, m, n) of two lines are connected by the relations $l+m+n=0, 2lm-mn+2nl=0$ then the d.c.'s of the two lines are

A. $(1/\sqrt{6}, 1/\sqrt{6}, -2/\sqrt{6}), (1/\sqrt{6}, -2/\sqrt{6}, 1/\sqrt{6})$

B. $(1/14, 2/14, 3/14), (1/26, 3/26, 4/36)$

C. $(1/\sqrt{14}, 2/\sqrt{14}, 3/\sqrt{14}), (1/\sqrt{26}, 3/\sqrt{26}, 4/\sqrt{26})$

D. none

Answer:

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38. If the d.c.'s (l, m, n) of two lines are connected by the relations $l+5m+3n=0, 7l^2+5m^2-3n^2=0$ then the d.c.'s of the two lines are

A. $(1/\sqrt{6}, 1/\sqrt{6}, -2/\sqrt{6}), (1/\sqrt{6}, -2/\sqrt{6}, 1/\sqrt{6})$

B. $(1/\sqrt{14}, -2/\sqrt{14}, 3/\sqrt{14}), (1/\sqrt{6}, 1/\sqrt{6}, -2/\sqrt{6})$

C. $\left(1/\sqrt{14}, 2/\sqrt{14}, 3/\sqrt{14}\right), \left(1/\sqrt{26}, 3/\sqrt{26}, 4/\sqrt{26}\right)$

D. none

Answer:

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39. If the d.c.'s (l, m,n) of two lines are connected by the relations $7l^2 + 5m^2 - 3n^2 = 0, l - 5m + 3n = 0$ then the d.c.'s of the two lines are

A. $\left(1/\sqrt{6}, 1/\sqrt{6}, -2/\sqrt{6}\right), \left(1/\sqrt{6}, -2/\sqrt{6}, 1/\sqrt{6}\right)$

B. $\left(1/\sqrt{14}, -2/\sqrt{14}, 3/\sqrt{14}\right), \left(1/\sqrt{6}, 1/\sqrt{6}, -2/\sqrt{6}\right)$

C. $\left(1/\sqrt{14}, 2/\sqrt{14}, 3/\sqrt{14}\right), \left(-1/\sqrt{6}, 1/\sqrt{6}, 2/\sqrt{6}\right)$

D. none

Answer:

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40. If the d.c.'s (l, m, n) of two lines are connected by the relations $l+m-n=0, 12lm-mn-61n=0$ then the angle between the lines is

A. $\cos^{-1}\frac{19}{\sqrt{364}}$

B. 45°

C. 60°

D. 90°

Answer:

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41. If the d.c.'s (l, m, n) of two lines are connected by the relations $3l+m+5n=0, 6mn-2nl+5lm=0$ then the angle between the lines is

A. $\cos^{-1}\left(\frac{1}{6}\right)$ or $\pi-\cos^{-1}\left(\frac{1}{6}\right)$

B. 45°

C. $60^\circ \quad \text{or} \quad 120^\circ$

D. $\cos^{-1}\frac{19}{\sqrt{364}}$

Answer:

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42. The direction ratios of two lines are given by $a+b+c=0, 2ab+2ac-bc=0$. Then the angle between the lines is

A. π

B. $\pi/3$

C. $\pi/2$

D. $\pi/6$

Answer:

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43. If the d.c.'s (l, m, n) of two lines are connected by the relations $l+m+n=0$ and $2mn+3\ln-5lm=0$ then the angle between the lines is

A. $\pi/4$

B. $\pi/3$

C. $\pi/6$

D. $\pi/2$

Answer:

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44. If the direction ratios of two lines are given by $l+m+n=0, mn-2n+lm=0$, then the angle between the lines is

A. $\pi/4$

B. $\pi/3$

C. $\pi/2$

D. 0

Answer:

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45. If the direction rations of two lines are given by 3lm-4ln+mn = 0 and l + 2m + 3n = 0 then the angle between the lines is

A. $\pi/2$

B. $\pi/3$

C. $\pi/4$

D. $\pi/6$

Answer:

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46. The acute angle between the two lines whose direction ratios are given by $l + m - n = 0$ and $l^2 + m^2 - n^2 = 0$ is

A. 0

B. $\pi/6$

C. $\pi/4$

D. $\pi/3$

Answer:

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47. Find the angle between the lines whose d.c's are related by $l + m + n = 0 \& l^2 + m^2 - n^2 = 0$

A. $\pi/2$

B. $\pi/3$

C. $\pi/4$

D. $\pi/6$

Answer:

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48. The angle between the lines whose direction cosines satisfy the equations $l+m+n=0$ and $l^2=m^2+n^2$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{4}$

Answer:

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49. If the direction cosines of two lines are given by $l + m + n = 0$ and $l^2 - 5m^2 + n^2 = 0$ then the angle between them is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer:

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50. If the d.c.'s (l, m, n) of two lines are connected by the relations $2l + m + 2n = 0$ and $3l^2 + 5m^2 - 11n^2 = 0$ then the angle between the lines is

A. $\pi/4$

B. $\pi/3$

C. $\pi/6$

D. $\pi/2$

Answer:

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51. P.T the smaller angle θ between any two diagonals of a cube is given by $\cos\theta = 1/3$

A. $\cos^{-1}(1/3)$

B. $\cos^{-1}\sqrt{2/3}$

C. $\cos^{-1}\left(1/\sqrt{3}\right)$

D. $\cos^{-1}(2/3)$

Answer:

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52. The angle between a diagonal of a cube and the diagonal of a face of the cube is

A. $\cos^{-1}(1/3)$

B. $\cos^{-1}\sqrt{2/3}$

C. $\cos^{-1}\left(1/\sqrt{3}\right)$

D. $\cos^{-1}(2/3)$

Answer:

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53. If a line makes angles $\alpha, \beta, \lambda, \delta$ with the four diagonals of a cube, then show that $\cos^2\alpha + \cos^2\beta + \cos^2\lambda + \cos^2\delta = \frac{4}{3}$.

A. $1/3$

B. $2/3$

C. $1/5$

D. $4/3$

Answer:

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54. If (6,-2,-3),(1,2,2) are d.r's of two lines then the d.c's of line bisecting the angle between them are

A. $\left(\frac{25}{\sqrt{714}}, \frac{8}{\sqrt{714}}, \frac{5}{\sqrt{714}}\right), \left(\frac{11}{\sqrt{1050}}, -\frac{20}{\sqrt{1050}}, -\frac{23}{\sqrt{1050}}\right)$

B. $\left(\frac{13}{\sqrt{210}}, \frac{4}{\sqrt{210}}, \frac{5}{\sqrt{210}}\right), \left(\frac{1}{\sqrt{6}}, -\frac{2}{\sqrt{6}}, -\frac{1}{\sqrt{6}}\right)$

C. $\left(-\frac{25}{\sqrt{714}}, \frac{8}{\sqrt{714}}, -\frac{5}{\sqrt{714}}\right), \left(\frac{11}{\sqrt{1050}}, -\frac{20}{\sqrt{1050}}, -\frac{23}{\sqrt{1050}}\right)$

D. $\left(\frac{23}{\sqrt{210}}, \frac{40}{\sqrt{210}}, \frac{5}{\sqrt{210}}\right), \left(\frac{1}{\sqrt{6}}, -\frac{2}{\sqrt{6}}, -\frac{1}{\sqrt{6}}\right)$

Answer:

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55. The projection of the join of the points (3, 4, 2), (5, 1, 8) on the line whose d.c.'s are $\left(\frac{2}{7}, -\frac{3}{7}, \frac{6}{7}\right)$ is

A. 7

B. $46/13$

C. $42/13$

D. $38/13$

Answer:

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56. The projection of the line segment joining the origin and the point P (5, 2, 4) on the line whose d.c.'s are $\left(\frac{2}{7}, -\frac{3}{7}, \frac{6}{7}\right)$ is

A. 13

B. 10

C. 6

D. 4

Answer:

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57. The projection of the join of the two points A(2, 3, 4), B(3, 5, -2) on the line whose d.r.'s are (2, 3, -6) is

A. $7/3$

B. $7/6$

C. 21

D. $44/7$

Answer:

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58. If the projections of the line segment $\overline{PQ}$ on the axes are 3, 4, 12 then the length of $\overline{PQ}$ is

A. 12

B. 13

C. $\sqrt{50}$

D. $2\sqrt{5}$

Answer:

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59. If the projections of a line segment on the axes are 3, -4, 12 then the length of the segment and d.c.'s of the line are

A. $13, \left(\frac{3}{13}, -\frac{4}{13}, \frac{12}{13}\right)$

B. $3, \left(\frac{2}{3}, \frac{1}{3}, \frac{2}{3}\right)$

C. $13\left(\frac{12}{13}, \frac{4}{13}, \frac{3}{13}\right)$

D. none

Answer:

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60. If the porjections of a line segment on the axes are 2, 1, 2 then the length of the segment and d.c.'s of the line are

A. $13, \left(\frac{3}{13}, -\frac{4}{13}, \frac{12}{13}\right)$

B. $3, \left(\frac{2}{3}, \frac{1}{3}, \frac{2}{3}\right)$

C. $13\left(\frac{12}{13}, \frac{4}{13}, \frac{3}{13}\right)$

D. none

Answer:

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61. The projections of a vector on the three coordinate axes are 6, -3, 2 respectively. The direction cosines of the vector are

A. $\frac{6}{5}, -\frac{3}{5}, \frac{2}{5}$

B. $\frac{6}{7}, -\frac{3}{7}, \frac{2}{7}$

C. $-\frac{6}{7}, -\frac{3}{7}, \frac{2}{7}$

D. 6, -3, 2

Answer:

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62. If A = (-2, 3, 4), B = (-4, 4, 6), C = (4, 3, 5), D = (0, 1, 2) then the projection of AB on CD is

A. 0

B. 5

C. 7

D. 27

Answer:

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63. If A(2, -1, 4), B(0, 1, 5), C(4, 3, 5), D(6, 4, 3) then the projection of $\overline{AB}$ on $\overline{CD}$ is

A. $4/3$

B. $3/4$

C. $-4/3$

D. $-3/4$

Answer:

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64. If the projection of a line of length d on the coordinate axes are d_1, d_2, d_3 respectively then, prove that $d^2 = \frac{d_1^2 + d_2^2 + d_3^2}{2}$

A. $2d^2$

B. $3d^2$

C. d^2

D. $5d^2$

Answer:

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65. If A(3, -1, 11), B(0, 2, 3), C(4, 8, 11) are three points, then the foot of the perpendicular drawn from the point A to the line joining the points B and C is

A. (3, 5, 7)

B. (2, 5, 7)

C. (5, 9, 6)

D. (1, 2, 3)

Answer:

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Exercise 2 Set 1

1. I : If OP = 21 and d.c.'s of $\overrightarrow{OP}$ are (2/7, 6/7, -3/7) then P = (6, 18, -9).

II : If P = (3, 4, -12) then d.c.'s of $\overrightarrow{OP}$ are (3/13, 4/13, -12/13)

A. Only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer:

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2. If α, β, γ are the angles made by a line with the positive directions of the coordinate axes, then $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A. Only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer:

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3. If P = (0, 1, 2), Q = (4, -2, 1), O = (0, 0, 0) then $\angle POQ =$

A. Only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer:

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4. The direction ratios of two lines are given by $a+b+c=0, 2ab+2ac-bc=0$. Then the angle between the lines is

A. Only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer:

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Exercise 2 Set 2

1. If the d.c.'s are (l, m, n) whose d.r's of a ray are (3, -4, 12) then ascending order of l, m, n is

A. l, m, n

B. m, n, l

C. m, l, n

D. n, l, m

Answer:

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2. The values of cosine of the angles made by the line with d.c.'s (2/7, 3/7, 6/7) with the lines with d.r.'s in descending order of magnitude is

A) (1, 0, 0) B) (0, 1, 0) C) (0, 0, 1) D) (1, 1, 1)

A. D, C, B, A

B. C, D, A, B

C. B, A, D, C

D. A, B, C, D

Answer:

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3. If the projections of $\overline{PQ}$ on the axes are 2, -2, 1 then the length PQ =

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