MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

THREE DIMENSIONAL GEOMETRY

Question Bank

1. The direction cosines of the line making angles $45^o, 30^o$ and 120^o with the coordinate axes are

A. $\frac{1}{\sqrt{2}}, \frac{\sqrt{3}}{2}, \frac{1}{2}$

B. $\frac{1}{\sqrt{2}}, \frac{\sqrt{3}}{2}, -\frac{1}{2}$

C. $-\frac{1}{\sqrt{2}}, \frac{\sqrt{3}}{2}, \frac{1}{2}$

D. $\frac{1}{\sqrt{2}}, -\frac{\sqrt{3}}{2}, -\frac{1}{2}$

Answer: B

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2. The direction cosines of the line making angles $135^o, 1200^o$ and 30^o with the coordinate axes are

A. $-\frac{1}{\sqrt{2}}, \frac{1}{2}, \frac{\sqrt{2}}{2}$

B. $-\frac{1}{\sqrt{2}}, -\frac{1}{2}, -\frac{\sqrt{2}}{2}$

C. $-\frac{1}{\sqrt{2}}, -\frac{1}{2}, \frac{\sqrt{2}}{2}$

D. $\frac{1}{\sqrt{2}}, \frac{1}{2}, \frac{\sqrt{2}}{2}$

Answer: C

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3. The direction cosines of a line are 1/2, 1/2 , k and $k > 0$, then k =

A. 44228

B. $\frac{1}{\sqrt{2}}$

C. 1

D. 44256

Answer: C

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4. The direction ratios of a line are 1,-1,0 then the angle of inclination of the linw with y-axis is

A. $\frac{3\pi}{4}$

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

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

D. $-\frac{\pi}{6}$

Answer: A

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5. The direction cosines of the line joining A(2,-3,1) and B(3,-1,2) are

A. $/1\sqrt{6}, \frac{-2}{\sqrt{6}}, \frac{1}{\sqrt{3}}$

B. `2/sqrt6,-3/sqrt6,1/sqrt6

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

D. $\frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}, \frac{1}{\sqrt{6}}$

Answer: D

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6. Angle between the lines whose direction ratios are 3,4,5 and 2,2,1 is

A. 45^o

B. 60^o

C. $\left(\cos^{-1}\right)\frac{\sqrt{3}}{4}$

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

Answer: A

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7. The angle between the lines whose direction ratios are 1,-2,1 and 4,3,2 is

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

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

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

D. $\frac{2\pi}{3}$

Answer: C

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8. The points (6,-1,2),(5,2,4) and (8,-7,k) are collinear, then k =

A. 2

B. 3

C. -2

D. 1

Answer: C

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9. The acute angle between the lines whose direction cosines are proportional to 3,-1,2 and 2,1,-3 is

A. $\left(\cos^{-1}\right)\frac{2}{\sqrt{14}}$

B. $\left(\cos^{-1}\right)-\frac{1}{14}$

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

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

Answer: B

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10. l=m=n=1 represent direction cosines of

A. the line one unit from x-axis

B. the line one unit from y-axis

C. the line one unit from z-axis

D. no line

Answer: D

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11. If a line lies in the octant O X Y Z and it makes equal angles with the axes, then its d.c's are such that

A. $l = m = n = \frac{1}{\sqrt{3}}$

B. $l = m = n = \pm \frac{1}{\sqrt{3}}$

C. $l = m = n = -\frac{1}{\sqrt{3}}$

D. $l = m = n = \pm \frac{1}{\sqrt{2}}$

Answer: A

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12. The direction cosines of the line joining (4,3,-5) and (-2,1,-8) are

A. 6/7,2/7,3/7

B. 2/7,3/7,6/7

C. 6/7,3/7,2/7

D. - 6/7,3/7,-2/7

Answer: A

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13. The coordinates of the point P=(3,4,5), then the direction cosines of `vec OP are

A. 3,4,5

B. 1/3,1/4,1/5

C. 3/50,4/50,1/10

D. $\frac{3}{5\sqrt{2}}, \frac{4}{5\sqrt{2}}, \frac{1}{\sqrt{2}}$

Answer: D

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14. A vector $\vec{r}$ is inclined at equal angles to O X, OY and OZ. If the magnitude of $\vec{r}$ is 6 units, then $\vec{r} =$

A. $2\sqrt{3}(i+j+k)$

B. $-2\sqrt{3}(i+j+k)$

C. $2\sqrt{3}(-i+j+k)$

D. $2\sqrt{3}(i-j+k)$

Answer: A

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15. The direction cosines of a normal to the yz-plane are

A. (0,0,1)

B. (1,0,0)

C. (0,1,0)

D. (1,1,0)

Answer: B

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16. If (1/3,1/4,k) are the direction cosines of a line then the value of k is

A. 119/12

B. $\frac{\sqrt{119}}{12}$

C. 119/114

D. 44541

Answer: B

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17. The direction ratios of $\overrightarrow{PQ}$ are 1,2,2 and P(2,-1,4). If $\left|\overrightarrow{PQ}\right| = 5$ units, the coordinates of Q are

A. (11, 7, 22)

B. (11/3,7/3,22/3)

C. (11/5,7/5,22/5)

D. (11/2, -7, 22/4)

Answer: B

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18. If the direction cosines of two lines are proportional to 2,3,-6 and 3 ,-4,5, then the acute angle between then

A. $\left(\cos^{-1}\right)\left(\frac{49}{36}\right)$

B. `(cos^(-1)) (18sqrt2)/35

C. 90^o

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

Answer: B

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19. A line making anlges 45° and 60° with the positive direction of the axis of x and y makes with the positive direction of z axis

angle of

A. 30^o or 150^o

B. 60^o or 120^o

C. 45^o or 135^o

D. 90^o

Answer: B

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20. The distance of the point (4,3,5) from the y-axis is

A. $\sqrt{34}$

B. 5

C. $\sqrt{41}$

D. $\sqrt{15}$

Answer: C

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21. The distance of the point A(2,3,4) from z-axis is

A. 5

B. $\sqrt{13}$

C. $2\sqrt{5}$

D. $5\sqrt{2}$

Answer: B

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22. Coordinates of the foot of the perpendicular from the point (3,4,7) on y - axis is

A. (3,0,0)

B. (0,4,0)

C. (0,0,7)

D. $(0, \sqrt{5}, 0)$

Answer: B

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23. If the points (7,-2) , (5,1) and (3,5) are collinear. Find the value of k.

A. 1

B. minus 1

C. 2

D. minus 2

Answer: A

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24. The points A (4,5,1), B (0,-1,-1), C(3,9,4) and D(-4,4,4) are

A. collinear

B. coplanar

C. non coplanar

D. non collinear and non coplanar

Answer: B

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25. The direction cosines l, m, n of two lines are connected by the relation l+m+n=0 and l . m=0 then the angle between them is

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

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

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

D. 0

Answer: A

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26. The ratio in which the line joining points (2, 4, 5), (3,5,- 4) is divided by yz-plane is :

A. 0.085416666666667

B. 0.12638888888889

C. minus 2 :3

D. 4:-3

Answer: C

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27. The projection of a line segment on x, y, z axes are respectively $\sqrt{2}$, 5,3. The length of the line segment is

A. 6

B. 11

C. 8

D. 5

Answer: A

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28. If the projection of a line segment PQ on the coordinate axes are 3,4,5, then the length of the line segment is

A. $3\sqrt{2}$

B. $7\sqrt{2}$

C. $6\sqrt{2}$

D. $5\sqrt{2}$

Answer: D

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29. If the projection a of a line segment PQ on the coordinate as are 2,3,6, then its direction cosines are

A. 2/7,3/7,6/7

B. -2/7,3/7,6/7

C. - 2/7, - 3/7, 6/7

D. 2/7, -3/7,-6/7

Answer: A

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30. The projection of the line segment joining P(2,-1,0) and Q(3,-2,1) on the line whose direction ratios are 2,3,4 is

A. $\frac{2}{\sqrt{29}}$

B. $\frac{3}{\sqrt{29}}$

C. $\frac{4}{\sqrt{29}}$

D. $\frac{1}{\sqrt{29}}$

Answer: B

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31. The ratio in which the line joining (3,4,-7) and (4,2,1) is divided by xy -plane

A. 0.142855555555555

B. 0.084027777777778

C. 0.29236111111111

D. 0.16875

Answer: C

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32. The points (3,4,-3) divides the line joining the points (2,3,-1) and (5,6,-7) is

A. 2:3

B. 4:3

C. 1:2

D. 2:1

Answer: B

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33. The area of triangle whose vertices are (1,2,3), (2,5,-1) and (-1,1,2) is

A. 150 sq. units

B. 145 sq. units

C. $\frac{\sqrt{155}}{2}$ sq. units

D. $\frac{155}{2}$ sq.units

Answer: C

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34. If α, β, γ and δ be four angles of a cyclic qardrilateral, then the value of : $\cos\alpha + \cos\beta + \cos\gamma + \cos\delta$ is :

A. 44259

B. 44263

C. 44262

D. 1

Answer: B

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35. The equation `x^(2) + y^(2) + z^(2) = 0 represents

A. a plane

B. pair of planes

C. a line

D. the origin

Answer: D

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36. The equation a x+b y+c=0 represents a plane perpendicular to the

A. yz-plane

B. xy-plane

C. zx - plane

D. ax+by + d =0

Answer: B

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37. The equation of the line passing through the points (4,-5,-2) and (-1,5,3) is

A. (x-4)/1 = (y+5)/-2 = (z+2)/-1

B. (x+4)/1 = (y-5)/2 = (z-3)/-1

C. x/-1 = y/5 = z/3

D. x/4 = y/-5 = z/-2

Answer: A

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38. Equation of the plane containing the straight line $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ and perpendicular to the plane containing the

straight lines $\frac{x}{3}=\frac{y}{4}=\frac{z}{2}$ and $\frac{x}{4}=\frac{y}{2}=\frac{z}{3}$ is :

A. x-2y-2z+2 =0

B. 2x+2y-z+4 = 0

C. 5x-8y-9z+10 = 0

D. x+y-2 =0

Answer: C

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39. Find the equation of the plane through the line of intersection of the planes $x+y+z=1$ and $2x+3y+4z=5$ which is perpendicular to the plane $x-y+z=0$.

A. x-2y-5z = 0

B. $x-y-z=0$

C. $2x-y+2z=0$

D. $6x-7y-10z=0$

Answer: D

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40. The equation of the plane passing through $(1,-1,1)$ and through the line of intersection of the planes, $x+2y-3z+1=0$ and $3x-2y+4z+3=0$ is

A. $3x-4y+2z-9=0$

B. $2x-sy+z-6=0$

C. $7x+6y-8z+7=0$

D. $7x-6y-8z-5=0$

Answer: C

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41. The equation of the plane through the points (1,-1,0), (0,-2,1) and (2,0,-3) is

A. $2x+2y-1 = 0$

B. $x+z-1 = 0$

C. $x-y-2 = 0$

D. $y+z+1 = 0$

Answer: C

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42. Equation of the line passing through (1, 1,1) and perpendicular to $2x + 3y + z = 5$ is:

A. $2x-4y+3z-12 = 0$

B. $2x+4y+3z -4 = 0$

C. $2x+4y-3z+8 = 0$

D. $2x-4y-3z = 0$

Answer: A

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43. Equation of the plane through P(2,2,-3) and perpendicular to OP, where O is the origin, is

A. $2x+2y-3z -17 =0$

B. $2x-2y-3z-9 = 0$

C. $2x+2y+3z-11 = 0$

D. $2x-2y+3z+9 = 0$

Answer: A

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44. Equation of the plane through the points (3,-1,2) and (2,1,3) and parallel to x -axis is

A. $y+2z+5 = 0$

B. $x+y-5 = 0$

C. $y-2z+5 = 0$

D. $2x+y-5 = 0$

Answer: C

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45. Equation of the plane passing through the points (3,-1,2) and (2,2,-1) and parallel to the z -axis is

A. $2x+z-1=0$

B. $3x+y-8=0$

C. $3x-z-7=0$

D. $3x+z-7=0$

Answer: C

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46. Write the direction cosines of x-axis.

A. lx + my + nz = l +2m +3n

B. (x-1)/l +(y-2)/m+(z-3)/n = 0

C. $lx + my + nz = \sqrt{14}$

D. (lx)/1+(my)/2+(nz)/3 = 0

Answer: A

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47. The equation of the line passing through the intersection of the lines $x + 2y + 3 = 0$ and $3x + 4y + 7 = 0$ and parallel to $y - x = 8$ is

A. 44228

B. 44230

C. 1

D. minus 1/2

Answer: C

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48. Find the equation of the line passing through (2, 3) & (4, -5)

A. 4x+8y+7z = 41

B. 4x-8y+7z = 41

C. 4x-8y-7z = 41

D. 4x-8y+7z = 39

Answer: B

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49. Equation of the plane passing through (2,3,4) and parallel to the plane 5x-6y+7z=3 is

A. 5x-6y+7z+20 = 0

B. 5x-6y+7z-20 = 0

C. - 5x+6y+7z-3 = 0

D. 5x+6y+7z+3 = 0

Answer: A

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50. The angle between two lines $\frac{x+1}{2} = \frac{y+3}{2} = \frac{z-4}{-1}$ and $\frac{x-4}{1} = \frac{y+4}{2} = \frac{z+1}{2}$ is :

A. 13x+4y+19 = 0

B. 13y+4z+19 = 0

C. 13x+4z+19 = 0

D. 4x+1y-4z -19 =0

Answer: B

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51. The ratio in which the plane 4x+5y-3z=8 divides the line joining the points (-2,1,5) and (3,3,2) is

A. 1)2:1

B. 2)1:2

C. 3)-2:1

D. 4)2:-1

Answer: A

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52. If the straight lines $2x + 3y - 3 = 0$ and $x + ky + 7 = 0$ are perpendicular, then the value of k is

A. 44266

B. 44503

C. minus 11/3

D. minus 3/11

Answer: C

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53. The acute angle between the planes x+3y-z+2=0 and 2 x-3y+z-1=0 is

A. $\left(\cos^{-1}\right)\frac{2\sqrt{2}}{\sqrt{77}}$

B. $\left(\cos^{-1}\right)\frac{4\sqrt{2}}{\sqrt{77}}$

C. $\left(\cos^{-1}\right)\frac{\sqrt{2}}{\sqrt{77}}$

D. $\left(\cos^{-1}\right)\frac{2}{\sqrt{77}}$

Answer: B

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54. The angle between the two planes 3x- 4y + 5z = 0 and 2x-y - 2z = 5 is :

A. $\left(\cos^{-1}\right)\frac{2\sqrt{2}}{\sqrt{21}}$

B. $\left(\cos^{-1}\right)\frac{4\sqrt{2}}{\sqrt{77}}$

C. $\left(\cos^{-1}\right)\frac{\sqrt{2}}{\sqrt{21}}$

D. $\left(\cos^{-1}\right)\frac{1}{\sqrt{21}}$

Answer: A

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55. Distance between the parallel planes 2x-3y+4 z-1=0 and 4x-6y+8z+8=0 is

A. $\frac{5}{\sqrt{29}}$

B. $\frac{9}{2}\sqrt{29}$

C. $\frac{1}{\sqrt{29}}$

D. $\frac{9}{\sqrt{29}}$

Answer: B

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56. The direction cosines of the normal to the plane 2x-2y+z-1 =0 are

A. $\frac{2}{\sqrt{3}}, -\frac{2}{\sqrt{3}}, \frac{1}{\sqrt{3}}$

B. $\frac{2}{3}, -\frac{2}{3}, \frac{1}{3}$

C. $\frac{2}{3}, \frac{2}{3}, -\frac{1}{\sqrt{3}}$

D. $-\frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}}, \frac{1}{\sqrt{3}}$

Answer: B

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57. The intercepts of the plane 3 x+4 y-5 z-4=0 on the coordinate axes are

A. 4/3,1/3,-4/5

B. 4,1,-5

C. 4/3,1,-4/5

D. 3,4,-5

Answer: C

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58. A plane meets the coordinate axes at A, B, C such that the centroid of the triangle is (3, 3, 3). The equation of the plane is :

A. 1

B. 2

C. 3

D. 4

Answer: C

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59. If the plane 3x+4y-3z+2=0 cuts the coordinate axes at A, B, C, then the centroid of the triangle ABC is

A. (-2/9,-1/6,2/9)

B. (2/9,-1/6,2/9)

C. (-2/9,1/6,2/9)

D. (-2/9,-1/6,-2/9)

Answer: A

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60. A plane meets the coordinate axes at A, B, C such that the centroid of the triangle ABC is (3,4,5). Then the equation of the plane is

A. 20x - 15y +12z = 180

B. 20x + 15y +12z = 180

C. 20x - 15y -12z = 180

D. 20x + 15y -12z = 180

Answer: B

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61. The plane x/4 + y/3 -z/5 =1 cuts the axes at A, B, C then the area of the triangle ABC is

A. $\sqrt{769}$

B. $\frac{1}{2}\sqrt{51}$

C. $\sqrt{51}$

D. $\frac{1}{2}\sqrt{769}$

Answer: D

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62. The distance of the point (1,0,2) from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane x-y+z=16 is

A. (5,15,10)

B. (5,-15,10)

C. (5,15,-10)

D. (-5,15,10)

Answer: C

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63. The length of the perpendicular from the origin to the plane $3x+4y+12z\neq 52$ is

A. 3

B. -4

C. 5

D. 4

Answer: D

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64. Find the distance of the point (2,3,-5) from the plane $r.(i+2j-2k)=9.$

A. 4

B. 3

C. 2

D. 1

Answer: B

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65. The foot of the perpendicular from (-2,3) to the line $2x - y - 3 = 0$ is

A. (-3,0,2)

B. (-2,1,-1)

C. (0,2,-8)

D. (2,-2,0)

Answer: A

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66. The image of the point (- 1, 3, 4) in the plane:

x-2y=0 is:

A. (-1,1,-2)

B. (2,-3,-5)

C. (2,-4,0)

D. (-1,-1,-1)

Answer: B

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67. Find the image of (2,3) on the line 3x+5y=4.

A. (2,-1,11)

B. (-1,2,1)

C. (-1,4,8)

D. (3,4,-8)

Answer: C

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68. If the planes $\vec{r}.(2i+\lambda j+k)=3$ and $\vec{r}.(4i+j+\mu k)=5$ are parallel, then the values of λ and μ are

A. 1/2 , -2

B. - 1/2, 2

C. - 1/2 , -2

D. 1/2,2

Answer: D

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69. The angle between the lines $\frac{x+1}{2}=\frac{y-2}{5}=\frac{z+3}{4}$ and $\frac{x-1}{1}=\frac{y+2}{2}=\frac{z-3}{-3}$ is

A. $\left(\cos^{-1}\right)\left(\frac{5}{12}\right)$

B. ('pi'/3)`

C. $\left(\cos^{-1}\right)\left(\frac{2}{13}\right)$

D. $\left(\cos^{-1}\right)\left(\frac{4}{13}\right)$

Answer: B

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70. The angle between the lines $\frac{x-1}{1}=\frac{y-1}{1}=\frac{z-1}{2}$ and $\frac{x-1}{-\sqrt{3}-1}=\frac{y-1}{\sqrt{3}-1}=\frac{z-1}{4}$ is

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

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

C. $\left(\cos^{-1}\right)\frac{1}{65}$

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

Answer: B

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71. The angle between the lines $\frac{x+1}{2}=\frac{y-2}{5}=\frac{z+3}{4}$ and $\frac{x-1}{1}=\frac{y+2}{2}=\frac{z-3}{-3}$ is

A. 45^o

B. 30^o

C. 60^o

D. 90^o

Answer: D

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72. The perpendicular distance of P(1,2,3) from the line $\frac{x-6}{3}=\frac{y-7}{2}=\frac{z-7}{-2}$ is

A. 0

B. 5

C. 7

D. 10

Answer: C

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73. Given the line $L = \frac{x-1}{3} = \frac{y+1}{2} = \frac{z-3}{-1}$ and the plane $\pi : x - 2y - z = 0$, of the following assertions, the only one that is always true is:

A. L is perpendicular to π

B. L lies on π

C. L is parallel to π, but do not lie on π

D. L and π intersect and not perpendicular to each other

Answer: B

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74. The angle between the line (x-2)/3 = (y+1)/1 = (z-2)/(-1) and the plane 3x-4y+z = 3 is

A. $\left(\sin^{-1}\right)\left(\frac{5}{\sqrt{286}}\right)$

B. $\left(\sin^{-1}\right)\left(\frac{6}{\sqrt{286}}\right)$

C. $\left(\sin^{-1}\right)\frac{4}{\sqrt{286}}$

D. $\left(\cos^{-1}\right)\frac{3}{\sqrt{286}}$

Answer: A

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75. If the lines $\frac{x-1}{-3}=\frac{y-2}{2k}=\frac{z-3}{2}$ and $\frac{x-1}{3k}=\frac{y-1}{1}=\frac{z-6}{-3}$ are perpendicular, find the value of k.

A. minus 10/7

B. 44387

C. 44476

D. minus 7/10

Answer: A

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76. The distance of the point (2,3,-4) from the point of intersection of the line $\frac{x-1}{-3}=\frac{y-2}{2}=\frac{z-2}{1}$and the plane$2x-3y-z-20=0$ is

A. $\sqrt{24}$

B. $\sqrt{23}$

C. $\sqrt{66}$

D. $\sqrt{19}$

Answer: C

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77. If the lines :

$\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{4}$ and $\frac{x-3}{1}=\frac{y-k}{2}=\frac{z}{1}$

intersect , then k is equal to :

A. 44230

B. 44234

C. minus 7/2

D. minus 3/2

Answer: B

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78. Equation of the plane passing through (2,3,4) and parallel to the plane 5x-6y+7z=3 is

A. (x+2)/2 = (y-3)/3 = (z-4)/1

B. (x-+2)/1 = (y-3)/-2 =(z-4)/1

C. (x-2)/1 = (y+3)/2 = (z-4)/1

D. (x+2)/-1 - (y-3)/-2 = (z-4)/1

Answer: B


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79. Distance between the two planes 2 x+3 y+4 z=4 and 4 x+6 y+8 z=12 is

A. 2 units

B. 4 units

C. 8 units

D. $\frac{2}{\sqrt{29}}$ units

Answer: D

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80. The planes 2x-y+4 z=5 and 5x-2.5y+10z=6 are

A. perpendicular

B. parallel

C. intersect y-axis

D. passes through (0,0,5/4)

Answer: B

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81. The coordinates of the foot of the perpendicular drawn from the point (2,5,7) on the x -axis are given by

A. (2,0,0)

B. (0,5,0)

C. (0,07)

D. (0,5,7)

Answer: A

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82. P is a point on the line segment joining the points (3, 2, – 1) and (6, 2, - 2). If x co-ordinate of P is 5, then its y co-ordinate is :

A. 2

B. 1

C. minus 1

D. minus 2

Answer: A

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83. If α, β, γ are the angles that a line makes with the positive direction of x, y, z axis respectively, then the direction cosines of the line are

A. $\sin\alpha, \sin\beta, \sin\gamma$

B. $\cos\alpha, \cos\beta, \cos\gamma$

C. $\tan\alpha, \tan\beta, \tan\gamma$

D. $\cos^2\alpha, \cos^2\beta, \cos^2\gamma$

Answer: B

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84. The distance of the point P(a, b, c) from the x-axis is

A. $\sqrt{a^2 + c^2}$

B. $\sqrt{a^2 + b^2}$

C. $\sqrt{b^2 + c^2}$

D. $b^2 + c^2$

Answer: C

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85. The equation of x-axis in space are

A. $x = 0, y = 0$

B. $x = 0, z = 0$

C. $x = 0$

D. $y = 0, z = 0$

Answer: D

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86. A line makes equal angles with coordinate axes. Direction cosines of this line are :

A. $\pm(1, 1, 1)$

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

C. `+-(1/3,1/3,1/3)

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

Answer: B

Watch Video Solution

87. Distance of the point (α, β, γ) from the y-axis is

A. β

B. $|\beta|$

C. $|\beta| + |\gamma|$

D. $\sqrt{\alpha^2 + \gamma^2}$

Answer: D

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88. If the direction cosines of a line are k,k,k then

A. $k > 0$

B. $0 < k < 1$

C. k = 1

D. $k = \frac{1}{\sqrt{3}}$ or $k = \frac{-1}{\sqrt{3}}$

Answer: D

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89. Distance of the plane $\vec{r} \cdot \left(\frac{2}{7} i + \frac{3}{7} j + \frac{6}{7} k \right) = 1$ from the origin is

A. 1)1

B. 2)7

C. 3)4

D. 4)none of these

Answer: A

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90. The sine of the angle between the straight the $\frac{x-2}{3}=\frac{3-y}{-4}=\frac{z-4}{5}$ and the plane $2x-2y+z=5$ is

A. $\frac{10}{6\sqrt{5}}$

B. $\frac{4}{5\sqrt{2}}$

C. $\frac{2\sqrt{3}}{5}$

D. $\frac{\sqrt{2}}{10}$

Answer: D

Watch Video Solution

91. Reflection of the point (α, β, γ) in XY plane is

A. $(\alpha, \beta, 0)$

B. $(0, 0, \gamma)$

C. $(-\alpha, -\beta, \gamma)$

D. $(\alpha, \beta, -\gamma)$

Answer: D

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92. The area of the quadrilateral ABCD, where A (0, 4, 1), B (2, 3, -1), C(4, 5, 6) and D (2, 6, 2) is equal to :

A. 9 sq. units

B. 18 sq. units

C. 27 sq. units

D. 81 sq. units

Answer: A

Watch Video Solution

93. The locus represented by $xy + yz = 0$ is

A. a pair of perpendicular lines

B. a pair of parallel lines

C. a pair of parallel planes

D. a pair of perpendicular planes

Answer: D

Watch Video Solution

94. The plane $2x - 3y + 6z - 11 = 0$ makes an angle $\sin^{-1}(\alpha)$ with X - axis. The value of α is equal to

A. $\frac{\sqrt{3}}{2}$

B. $\frac{\sqrt{2}}{3}$

C. 44379

D. 44380

Answer: C

Watch Video Solution

95. A line with direction cosines proportional to 2,1,2 meets each of the lines x=y+a=z and x+a=2y=2z. The coordinates of each of the points of intersection are given by

A. (3a,3a,3a),(a,a,a)

B. (3a,2a,3a),(a,a,a)

C. (3a,2a,3a),(a,a,2a)

D. (2a,3a,3a),(2a,a,a)

Answer: B

Watch Video Solution

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

A. 44257

B. 44317

C. 44319

D. 44318

Answer: C

Watch Video Solution

97. Distance between two parallel planes: 2x + y + 2z = 8 and 4x + 2y + 4z +5=0 is:

A. 2/7

B. 7

C. 7/2

D. None of these

Answer: C

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98. The distance between the line $\vec{r} = 2i + 2j + 3k + \lambda(i - j + 4k)$ and the plane

$\overrightarrow{r}.(i+5j+k)=5$ is

A. 10

B. 10/3

C. 1

D. $\frac{10}{3\sqrt{3}}$

Answer: D

Watch Video Solution

99. If the angle θ between the $\frac{x+1}{1}=\frac{y-1}{2}=\frac{z-2}{2}$ and the plane $2x-y+\sqrt{\lambda}z+4=0$ is such that $\sin\theta=\frac{1}{3}$, the value of λ is :

A. 44289

B. minus 4/3

C. 44260

D. minus 3/5

Answer: C

Watch Video Solution

100. The angle between the lines $2x = 3y = -z$ and $6x = -y = 04z$ is

A. 45^o

B. 30^o

C. 0^o

D. 90^o

Answer: D

Watch Video Solution

101. The image of the point (- 1, 3, 4) in the plane:

x-2y=0 is:

A. (-17/3,-19/3,1)

B. (8,4,4)

C. (-17/3,-19/3,4)

D. (15, 11, 4)

Answer:

Watch Video Solution

102. The two lines x=ay+b, z=cy+d and x=a'y+b', z=c'y+d' are perpendicular to each other if :

A. $\frac{a}{a'} = \frac{c}{c'} = -1$

B. $\frac{a}{a'} = \frac{c}{c'} = 1$

C. $aa' + \hat{}(') = -1$

D. $aa' + \hat{}(') = 1$

Answer: C

Watch Video Solution

103. A variable plane is at a constant distance k from the origin and meets the coordinate axes at A, B, C. Then the locus of the centroid of the triangle ABC is

A. $x^{-2} + y^{-2} + z^{-2} = k^{-2}$

B. $x^{-2} + y^{-2} + z^{-2} = 4k^{-2}$

C. $x^{-2} + y^{-2} + z^{-2} = 16k^{-2}$

D. $x^{-2} + y^{-2} + z^{-2} = 9k^{-2}$

Answer: D

Watch Video Solution

104. If P = (0,1,2) and Q = (4,-2,1), O = (0,0,0) then $P\hat{O}Q =$

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

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

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

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

Answer: D

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105. If a line makes angles $\frac{\pi}{3}$ and $\frac{\pi}{4}$ with the x-axis and y-axis respectively. Then the angle made by the line with z-axis is

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

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

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

D. $\frac{5\pi}{12}$

Answer: B

Watch Video Solution

106. The foot of the perpendicular from (0,0,0) to the plane is (1,2,2). Then equation of the plane is

A. -x + 2y +8y - 9 = 0

B. $x+2y+2z - 9 = 0$

C. $x+y+z-5 = 0$

D. $x+2y-3y+1 = 0$

Answer: B

Watch Video Solution

107. If the plane $7x+11y+13z=3003$ meets the axes A, B, C then the centroid of the triangle ABC is

A. (143, 91, 77)

B. (143, 77, 91)

C. (91, 143, 77)

D. (143, 66, 91)

Answer: A

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108. A plane π passes through the point (1,1,1). If b, c, a are the direction ratios of a normal to the plane where $a, b, c(a < b < c)$ are the prime power factors of 2001 , then the equation of the plane π is

A. 29x+31y+3z = 63

B. 23x+29y-29z = 23

C. 23x+29y+3z = 55

D. 31x+37y+3z = 71

Answer: C

Watch Video Solution

109. The direction ratios of a normal to the plane passing through (0,0,1),(0,1,2) and (1,2,3) are

A. 0,1,-1

B. 1,0,-1

C. 0,0,-1

D. 1,0,0

Answer: A

Watch Video Solution

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

A. 0

B. $-\frac{\pi}{3}$

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

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

Answer: D

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111. In the space the equation by+cz+d=0 represents a plane perpendicular to the plane

A. YOZ

B. Z = K

C. XOZ

D. XOY

Answer: A

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112. If P=(0,1,0), Q=(0,0,1), then the projection of PQ on the plane x+y+z=3 is

A. $\sqrt{3}$

B. 3

C. $\sqrt{2}$

D. 2

Answer: C

Watch Video Solution

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

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

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

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

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

Answer: A

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114. Equation of the plane passing through (1,1,1) and (1,-1,-1) and perpendicular to 2x-y+z+5=0 is

A. $2x+5y+z-8 = 0$

B. $x+y-z-1 = 0$

C. $2x+5y+z+4 = 0$

D. $x-y+z-1 = 0$

Answer: B

Watch Video Solution

115. A plane pi makes intercepts 3 and 4 respectively on z-axis and x-axis. If the plane is parallel to y-axis then its equation is

A. $3x + 4z = 12$

B. $3z + 4x = 12$

C. $3y + 4z = 12$

D. $3z + 4y = 1$

Answer: A

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116. XOZ plane divides the join of (2,3,1) and (6,7,1) in the ratio

A. 0.1298

B. 0.088194

C. - 3:7

D. - 2 :7

Answer: C

Watch Video Solution

117. The point collinear with (1,-2,-3) and (2,0,0) among the following is

A. (0,4,6)

B. (0, -4, -5)

C. (0, -4, -6)

D. (0, -4, 6)

Answer: C

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

A. $\frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}, \frac{1}{\sqrt{14}}$

B. $\frac{2}{\sqrt{14}}, -\frac{3}{\sqrt{14}}, \frac{1}{\sqrt{14}}$

C. $-\frac{2}{\sqrt{14}}, -\frac{3}{\sqrt{14}}, \frac{1}{\sqrt{14}}$

D. $\frac{2}{\sqrt{14}}, -\frac{3}{\sqrt{14}}, -\frac{1}{\sqrt{14}}$

Answer: C

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119. If OA is equally inclined to OX, OY and OZ and if A is $\sqrt{3}$ units from the origin, then A is

A. (3,3,3)

B. (-1,1,-1)

C. (-1,1,1)

D. (1,1,1)

Answer: D

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120. The equation of the plane passing through the intersection of the planes $x+2y+3z+4=0$ and $4x+3y+2z+1=0$ and the origin is

A. $3x+2y+z+1 = 0$

B. $3x+2y+z = 0$

C. $2x+3y+z = 0$

D. $x+y+z = 0$

Answer: D

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121. The equation of the right bisector plane of the segment joining (2,3,4) and (6,7,8) is

A. x-y-z-15 = 0

B. x-y+z-15 = 0

C. x+y+z-15 = 0

D. x+y+z+15 = 0

Answer: C

Watch Video Solution

122. A line makes acute α, β and γ with the coordinate axes such that $\cos\alpha.\cos\beta = \cos\beta.\cos\gamma = \frac{2}{9}$ and $\cos\gamma.\cos\alpha = \frac{4}{9}$, then $\cos\alpha + \cos\beta + \cos\gamma =$

A. $\frac{5}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{3}{7}$

Answer: C

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123. If the direction ratios of two lines are (5,-12,13) and (-3,4,5) then the angle between them is

A. $\left(\cos^{-1}\right)\left(\frac{1}{65}\right)$

B. $\left(\cos^{-1}\right)\left(\frac{2}{65}\right)$

C. $\left(\cos^{-1}\right)\left(\frac{3}{65}\right)$

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

Answer: A

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124. Verify that the points $(0, 7, 10), (-1, 6, 6)$ and $(-4, 9, 6)$ are the vertices of an isosceles triangle

A. equilateral

B. isosceles

C. right angled

D. right angled isosceles

Answer: D

Watch Video Solution

125. The coordinates of the foot of the perpendicular from the point (2,3) on the line $x + y - 11 = 0$ is

A. (5,7,1)

B. (5/3,7/3,17/3)

C. (2/3,5/3,7/3)

D. (5/3,2/3,7/3)

Answer: B

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126. A line which makes angle 60^o with y -axis and z-axis, then the angle which it makes with x -axis is

A. 45^o

B. 60^o

C. 75^o

D. 30^o

Answer: A

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127. The points (5,-4,2),(4,-3,1),(7,-6,4),(8,-7,5) are vertices of a:

A. a rectangle

B. a square

C. a parallelogram

D. none of these

Answer: C

Watch Video Solution

128. The line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ is parallel to the plane

A. parallel to x-axis

B. parallel to y-axis

C. parallel to z-axis

D. perpendicular to z-axis

Answer: D

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129. The point equidistant from (a, 0, 0), (0, a, 0), (0, 0, a) and (0, 0, 0) is:

A. (a/4,b/4,c/4)

B. (a/2,b/4,c/4)

C. (a/2,b/2,c/2)

D. (a,b,c)

Answer: C

Watch Video Solution

130. The line joining the points (3,5,-7) and (-2,1,8) meets the yz - plane at the point

A. (0, 13/5,2)

B. (2,0,13/5)

C. (0,2,13/5)

D. (2,2,0)

Answer: A

 Watch Video Solution

131. If the coordinates of the vertices of a triangle ABC be A(-1,3,2), B(2,3,5), C(3,5,-2) then $\widehat{A} =$

A. 45^o

B. 60^o

C. 90^o

D. 30^o

Answer: C

Watch Video Solution

132. The equation of the plane in which the lines $\frac{x-5}{4}=\frac{y-7}{4}=\frac{z+3}{-5}$ and $\frac{x-8}{7}=\frac{y-4}{1}=\frac{z-5}{3}$ lie is

A. 17x - 47y -24z +172 = 0

B. 17x + 47y -24z +172 = 0

C. 17x + 47y +24z +172 = 0

D. 17x - 47y +24z +172 = 0

Answer: A

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133. If P be the point (2,6,3) then the equation of the plane through P at right angle to OP, O being the origin is

A. $2x+6y+3z = 7$

B. $2x-6y+3z = 7$

C. $2x+6y-3z = 49$

D. $2x+6y+3z = 49$

Answer: D

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134. The plane $x/2+y/3+z/4 = 1$ cuts the axes A, B, C then the area of the triangle ABC is

A. $\sqrt{29}$

B. $\sqrt{41}$

C. $\sqrt{61}$

D. none

Answer: C

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135. The intercepts of the plane 5x-3y+6z = 60 on the co-ordinate axes are

A. 10, 20, -10

B. 10, -20, 12

C. 12, -20, 10

D. 12, 20, -12

Answer: C

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136. Equation of x-axis is

A. $x/1 = y/1 = z/1$

B. $x/0 = y/1 = z/1$

C. $x/1 = y/0 = z/0$

D. $x/0 = y/0 = z/1$

Answer: C

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137. The angle between the line x/2 = y/3 = z/4 and the plane 3x+2y-3z = 4 is

A. 45^o

B. 0^o

C. $\cos^{-1}\left(\left(\frac{24}{\sqrt{29}}.\sqrt{22}\right)\right)$

D. 90^o

Answer: B

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138. The equation of a line of intersection of planes 4x+4y-5z=12 and 8x+12y-13z=32 can be written as

A. (x-1)/2 = (y+2)/-3 = z/4

B. (x-1)/2 = (y-2)/3 = z/4

C. x/2 = (y+1)/3 = (z-2)/4

D. x/2 = y/3 = (z-2)/4

Answer: B

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139. The equation of the plane which makes with coordinate axes a triangle with its centroid (α, β, γ) is

A. $\alpha x + \beta y + \gamma z = 3$

B. $\alpha x + \beta y + \gamma z = 1$

C. $\frac{x}{\alpha} + \frac{y}{\beta} + \frac{z}{\gamma} = 3$

D. $\frac{x}{\alpha} + \frac{y}{\beta} + \frac{z}{\gamma} = 1$

Answer: C

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140. A variable plane moves, so that the sum of the reciprocals of its intercepts on the coordinate axes is 1/2. Then the plane passes through

A. (1/2,1/2,1/2)

B. (-1,1,1)

C. (2,2,2)

D. (0,0,0)

Answer: C

Watch Video Solution

141. Equation of the plane passing through the line of intersection of the planes P= ax + by + cz + d = 0, $P' = a'x + b'y + c'z + d' = 0$ and parallel to x-axis it

A. $pa - p'a' = 0$

B. $\frac{p}{a} = \frac{p'}{a'} = 0$

C. $pa + p'a' = 0$

D. $\frac{p}{a} = \frac{P'}{a'}$

Answer: D

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142. The point of intersection of the line (x-5)/3 = (y-7)/(-1) = (z+2)/1 , (x+3)/(-36) = (y-3)/2 = (z-6)/4 is

A. (2,10,4)

B. (21,5/3,10/3)

C. (5,7,-2)

D. (-3,3,6)

Answer: B

 Watch Video Solution

143. The angle between the planes x+2y+2z =3 and -5x+3y+4z = 9 is

A. $\left(\cos^{-1}\right)\frac{9\sqrt{2}}{20}$

B. $\left(\cos^{-1}\right)\frac{3\sqrt{2}}{5}$

C. $\left(\cos^{-1}\right)\frac{3\sqrt{2}}{10}$

D. $\left(\cos^{-1}\right)\frac{19\sqrt{2}}{30}$

Answer: C

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144. The distance of the point A(2,3,4) from x-axis is

A. 5

B. $\sqrt{13}$

C. $2\sqrt{5}$

D. $5\sqrt{2}$

Answer: A

Watch Video Solution

145. The value of k such that the line $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies on the plane 2x - 4y + z = 7 is

A. 7

B. minus 7

C. no real value

D. 4

Answer: A

Watch Video Solution

146. A variable plane at a distance of 1 unit from the origin cuts the coordinate axes at A,B and C satisfies the relation $\frac{1}{x^2} + \frac{1}{y^2} + \frac{1}{z^2} = k$, then the value of k is :

A. 9

B. 3

C. 44440

D. 44256

Answer: A

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147. A plane passes through (1, - 2, 1) and is perpendicular to the planes 2x - 2y +z = 0 and x-y + 2z = 4. The distance of the plane from the point (1, 2, 2) is:

A. 0

B. 1

C. $\sqrt{2}$

D. $2\sqrt{2}$

Answer: D

Watch Video Solution

148. The point (α, β, γ) lies on the plane x+y+z = 2. Let, $\vec{a} = \alpha i + \beta j + \gamma k$ and $k \times \left(k \times \vec{a}\right) = \vec{0}$ then $\gamma =$

A. 0

B. 1

C. 2

D. 3

Answer: C

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149. Let $\vec{A}$ be a vector parallel to the line of intersection of planes $P_1$and P_2 through the origin. P_1 is parallel to the vectors 2j+3k and 4j-3k and P_2 is parallel to j-k and 3i+3j, then the angle between $\vec{A}$ and 2i+j-2k is

A. $\frac{\pi}{4}$ or $\frac{3\pi}{4}$

B. $\frac{\pi}{2} o \frac{f(3\pi)}{2}$

C. $\frac{\pi}{6}$ or $\frac{\pi}{3}$

D. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

Answer: A

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150. Consider the lines $L_1 = \frac{x+1}{3} = \frac{y+2}{1} = \frac{z+1}{2}, L_2 = \frac{x-2}{1} = \frac{y+2}{2} = \frac{z-3}{3}$

The unit vector perpendicular to L_1 and L_2 is

A. `1/sqrt99(-i+7j+7k)

B. $\frac{1}{5\sqrt{3}}(-i-7j+5k)$

C. $\frac{1}{5\sqrt{3}}(-i+7j+5k)$

D. $\frac{1}{\sqrt{99}}(7i-7j-k)$

Answer: B

Watch Video Solution

151. The shortest distance between the lines $L_1 : \frac{x+1}{3} = \frac{y+2}{1} = \frac{z+1}{2} L_2 = \frac{x-2}{1} = \frac{y+2}{2} = \frac{z-3}{3}$

is

A. 0

B. $\frac{17}{\sqrt{3}}$

C. $\frac{41}{5\sqrt{3}}$

D. $\frac{17}{5\sqrt{3}}$

Answer: D

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152. The equation of the line passing through the point (3,2) and perpendicular to the line $y = x$ is

A. $\frac{2}{\sqrt{75}}$

B. $\frac{7}{\sqrt{75}}$

C. $\frac{13}{\sqrt{75}}$

D. $\frac{23}{\sqrt{75}}$

Answer: C

Watch Video Solution

153. Let $(P(3, 2, 6)$ be a point in space and Q be point on the line $\vec{r} = \left(\hat{i} - \hat{j} + 2\hat{k}\right) + \mu\left(-3\hat{i} + \hat{j} + 5\hat{k}\right)$. Then the value of μ for which the vector $\overrightarrow{PQ}$ is parallel to the plane $x - 4y + 3z = 1$ is :

A. 44287

B. minus 1/4

C. 44409

D. minus 1/8

Answer: A

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154. If the distance of the point P (1,-2, 1) from the plane x + 2y - 2z = α where $\alpha > 0$, is 5, then the foot of the perpendicular from P to the plane is :

A. (8/3,4/3,7/3)

B. (4/3,4/3,1/3)

C. (1/3,2/3,10/3)

D. (2/3,-1/3,5/2)

Answer: A

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155. Equation of the plane containing the straight line $\frac{x}{2}=\frac{y}{3}=\frac{z}{4}$ and perpendicular to the plane containing the straight lines $\frac{x}{3}=\frac{y}{4}=\frac{z}{2}$ and $\frac{x}{4}=\frac{y}{2}=\frac{z}{3}$ is :

A. x+2y-2z = 0

B. 3x+2y-2z = 0

C. z-2y+z = 0

D. 5x+2y-4z = 0

Answer: C

Watch Video Solution

156. If the distance between the plane Ax+2y+z=d and the plane containing the lines (x-1)/2 = (y-2)/3 = (z-3)/4 and (x-2)/3 = (y-3)/4 = (z-4)/5 is $\sqrt{6}$, then |d| is equal to

A. 3

B. 4

C. 6

D. 1

Answer: C

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157. A line from the origin meets the lines $\frac{x-2}{1}=\frac{y-1}{-2}=\frac{z+1}{1}$ and $\frac{x-\frac{8}{3}}{2}=\frac{y+3}{-1}=\frac{z-1}{1}$ at P and Q respectively. If length $PQ=d$ then d^2 is equal to

A. 3

B. 4

C. 5

D. 6

Answer: D

Watch Video Solution

158. The direction ratios of a normal to the plane thro' (1,0,0), (0, 1, 0), which makes an angle of with $\frac{\pi}{4}$ the plane x + y = 3 are :

A. $1, \sqrt{2}, 1$

B. $1, 1, \sqrt{2}$

C. 1,1,2

D. $\sqrt{2}, 1, 1$

Answer: B

Watch Video Solution

159. The plane, which passes through the point (3, 2, 0) and the line $\frac{x-3}{1}=\frac{y-6}{5}=\frac{z-4}{4}$ is :

A. x-y+z =1

B. x+y+z = 5

C. x+2y-z = 1

D. 2x-y+z = 5

Answer: A

Watch Video Solution

160. The two lines x=ay+b, z=cy+d and x=a'y+b', z=c'y+d' are perpendicular to each other if :

A. $aa' + cc^{(')} = 1$

B. `aa^(') + cc^(') = -1

C. $ab + cd = a'b' + c'd'$

D. $aa' + \hat{}\ (') = \hat{}\ (') + dd'$

Answer: B

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161. Two system of rectangular axes have the same origin. If a plane cuts them at distance a,b,c and a', b' , c' from the origin , then :

A. $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} - \frac{1}{a^2} - \frac{1}{b^2} - \frac{1}{c^2} = 0$

B. $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} + \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} = 0$

C. $\frac{1}{a^2} + \frac{1}{b^2} - \frac{1}{c^2} + \frac{1}{a^2} + \frac{1}{b^2} - \frac{1}{c^2} = 0$

D. $\frac{1}{a^2}-\frac{1}{b^2}-\frac{1}{c^2}-\frac{1}{a^2}-\frac{1}{b^2}-\frac{1}{c^2}=0$

Answer: A

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162. A line with direction cosines proportional to 2,1,2 meets each of the lines x=y+a=z and x+a=2y=2z. The coordinates of each of the points of intersection are given by

A. (2a, 3a, a)(2a,a,a)

B. (3a,2a,3a),(a,a,a)

C. (3a,2a,3a),(a,a,2a)

D. (3a, 3a, 3a),(a,a,a)

Answer: B

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163. If the straight line, x =1 + s, y = 3-λs, z = 1+ λs and $x = \frac{t}{2}, y = 1 + t, z = 2 - t,$ with parameters s and t and respectively, are coplanar, then λ equals:

A. 0

B. minus 1

C. minus 1/2

D. minus2

Answer: D

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164. The distance between the line $\vec{r} = 2i + 2j + 3k + \lambda(i - j + 4k)$ and the plane $\vec{r}.(i + 5j + k) = 5$ is

A. 44265

B. 44472

C. $\frac{10}{3}\sqrt{3}$

D. 44449

Answer: C

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165. If the angle θ between the $\frac{x+1}{1} = \frac{y-1}{2} = \frac{z-2}{2}$ and the plane $2x - y + \sqrt{\lambda}z + 4 = 0$ is such that $\sin\theta = \frac{1}{3}$, the value of λ is :

A. minus 4/3

B. 44289

C. minus 3/5

D. 44260

Answer: D

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166. The image of the point (- 1, 3, 4) in the plane:

x-2y=0 is:

A. (-17/3,-19/3,4)

B. (15,11,4)

C. (-17/3,-19/3,1)

D. none of these

Answer: D

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167. Let L be the line of intersection of the planes:

$2x + 3y + z = 1$ and $x + 3y + 2z = 2$.

If L makes an angle α with the positive x-axis, then $\cos \alpha$ equals

A. 1

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{\sqrt{3}}$

D. 44228

Answer: C

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168. If the line passing through the point (5,1,a) and (3,b,1) crosses the yz-plane, at the point (0,17/2, -13/2) then

A. a = 6, b = 4

B. a = 8, b = 2

C. a = 2, b = 8

D. a = 4, b =6

Answer: A

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169. If the straight lines:

$$\frac{x-1}{k}=\frac{y-2}{2}=\frac{z-3}{3} \quad \text{and} \quad \frac{x-2}{3}=\frac{y-3}{k}=\frac{z-1}{2}$$

intersect at a point, then the integer k is equal to :

A. 2

B. minus 2

C. minus 5

D. 5

Answer: C

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170. Let the line $\frac{x-2}{3} = \frac{y-1}{-5} = \frac{z+2}{2}$ lie in the plane $x + 3y - \alpha z + \beta = 0$. Then (α, β) equals :

A. (6, -17)

B. (-6 , 7)

C. (5, -15)

D. (-5,5)

Answer: B

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171. 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. 60^o

B. 75^o

C. 30^o

D. 45^o

Answer: A

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172. The shortest distance between the lines (x-1)/2 = (y-2)/3 = (z-3)/4 and (x-2)/3 = (y-4)/4 = (z-5)/5 is

A. $\frac{1}{\sqrt{6}}$

B. 44348

C. 44256

D. $\frac{1}{\sqrt{3}}$

Answer: A

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173. The distance between the line $\vec{r} = 2i + 2j + 3k + \lambda(i - j + 4k)$ and the plane $\vec{r}.(i + 5j + k) = 5$ is

A. 44449

B. $\frac{10}{3\sqrt{3}}$

C. 44265

D. none of these

Answer: B

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174. Equation of the line passing through (1,1,1) and parallel to the plane$2x + 3y + z + 5 = 0$

A. $\frac{x-1}{1}=\frac{y-1}{2}=\frac{z-1}{1}$

B. $\frac{x-1}{-1}=\frac{y-1}{1}=\frac{z-1}{-1}$

C. $\frac{x-3}{3}=\frac{y-1}{2}=\frac{z-1}{1}$

D. $\frac{x-1}{2}=\frac{y-1}{3}=\frac{z-1}{1}$

Answer: B

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175. The line of intersection of the planes $\vec{r}.(3i-j+k)=1$ and $\vec{r}.(i+4j-2k)=2$ is parallel to the vector

A. 2i+7j+13k

B. -2i -7j +13k

C. 2i -7j +13k

D. -2i + 7j +13k

Answer: D

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176. Given the line $L = \frac{x-1}{3} = \frac{y+1}{2} = \frac{z-3}{-1}$ and the plane $\pi : x - 2y - z = 0$, of the following assertions, the only one that is always true is:

A. $Lisperpendicualar \to \pi$

B. $Llies \in \pi$

C. L is paralle to π

D. none of these

Answer: B

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177. The ratio in which the plane $\vec{r}.(i-2j+3k)=17$ divides the line joining the points -2i+4j+7k and 3i-5j+8k is

A. 1)3:5

B. 2)1:10

C. 3)3:10

D. 4)1:5

Answer: C

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178. If the lines $\frac{x-1}{-3}=\frac{y-2}{2k}=\frac{z-3}{2}$ and $\frac{x-1}{3k}=\frac{y-1}{1}=\frac{z-6}{-3}$ are

perpendicular, find the value of k.

A. $-\frac{7}{10}$

B. $-\frac{10}{7}$

C. -10

D. 4

Answer: B

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179. Equation of the plane containing the line $\vec{r} = i + j + \lambda(2i + j + 4k)$ is

A. $\vec{r}.(-I - 2j + k) = 3$

B. $\vec{r}.(i + 2j - k) = 0$

C. $\vec{r} . (i + 2j - k) = 3$

D. none of these

Answer: C

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180. The sine of the angle between the straight line (x-2)/3 = (y-3)/4 = (z-4)/5 and the plane, 2x-2y+z = 5 is

A. $\frac{10}{6\sqrt{5}}$

B. $\frac{4}{5\sqrt{2}}$

C. $\frac{\sqrt{2}}{10}$

D. $\frac{2\sqrt{5}}{5}$

Answer: C

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181. If the direction cosines of a line are 1/c, 1/c, 1/c then,

A. $0 < c < 1$

B. $c > 2$

C. $c > 0$

D. $c = \pm\sqrt{3}$

Answer: D

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182. The equation of the right bisector plane of the segment joining (2,3,4) and (6,7,8) is

A. x+y+z+15 = 0

B. x-y-z-15 = 0

C. x-y+z-15 = 0

D. x+y+z-15 = 0

Answer: D

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183. The angle between a line with direction ratio proportional to 2,2,1 and a line joining (3,1,4) and (7,2,12) is

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

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

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

D. none of these

Answer: A

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184. Equation of the plane through P(1,2,3) and parallel to the plane x+2 y+5 z=0 is

A. (x-1)+2(y-2)+5(z-3) =0

B. x+2y+5z =14

C. x+2y+5z = 6

D. none of these

Answer: A

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185. Equation of the plane passing through the mid point of the line segment of join of the points P(1,2,3) and Q(3,4,5) and perpendicular to it is

A. x+Y+z =9

B. x+y+z = -9

C. 2x+3y+4z = 9

D. 2x+3y+4z =-9

Answer: A

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186. If M denotes the midpoint of the line segment joining A(4 i+5j-10k) and B(-i+2 j+k), then the equation of the plane through

M and perpendicular to AB, is

A. $\vec{r}.(-5i-3j+11k)+\frac{135}{2}=0$

B. $\vec{r}.(4i+5j-10k)+4=0$

C. $\vec{r}.\left(\frac{3}{2}i+\frac{7}{2}j-\frac{9}{2}k\right)+\frac{135}{2}=0$

D. $\vec{r}.(-i+2j+k)+4=0$

Answer: A

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187. The angle between the lines (x+1)/1 = (y-3)/2 = (z+2)/3 and x/3 = (y-1)/(-2) = z/1 is

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

B. $\cos^{-1}\left(\frac{2}{7}\right)$

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

D. none of these

Answer: C

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188. A non-zero vector $\vec{a}$ is parallel to the line of intersection of the planes determined by the vectors i, i+j and the plane determined by the vectors i-j, j+k. The angle between $\vec{a}$ and i-2j+2k is

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

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

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

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

Answer: D

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189. The projection of the line joining the points (3,4,5) and (4,6,3) on the line joining the points (-1,2,4) and (1,0,5) is

A. 4/3

B. 2/3

C. 1/3

D. 1/2

Answer: A

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190. The projection of a line segment on the coordinate axes are 2,3,6. Then the length of the line segment is

A. 7

B. 5

C. 1

D. 11

Answer: A

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191. The equation of the plane through the intersection of the planes $x+y+z=1$ and $2x+3y-z+4=0$ and parallel to x -axis is

A. $y-z+6=0$

B. $3y-z+6=0$

C. $y-3z+6=0$

D. $3y-2z+6=0$

Answer: A

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192. The distance of the point $(3,8,2)$ from the line $(x-1)/2 = (y-3)/4 = (z-2)/3$ measured parallel to the plane $3x+2y-2z+15 = 0$ is

A. 2

B. 3

C. 6

D. 7

Answer: D

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193. If the position vectors of the points A and B are 3i+j+2k and i-2 j-4k respectively, then the equation of the plane through B and perpendicular to AB is

A. 2x+3y+6z+28 =0

B. 3x+2y+6z+28

C. 2x-3y+6z+28 =0

D. 3x-2y+6z =28

Answer: A

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194. Equation of the plane passing through the point (1,1,1) and perpendicular to each of the planes x+ 2y+3z-7=0 and 2x-3 y+4 z=0 is

A. 17x-2y+7z =12

B. 17x + 2y -7z =12

C. 17x +2y+7z =12

D. 17x - 2y -7z =12

Answer: B

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