# © 'doubtnut 

 India's Number 1 Education App
## MATHS

## BOOKS - KC SINHA MATHS (HINGLISH)

## 3D - STRAIGHT LINES

## Solved Examples

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

- Watch Video Solution

2. Find the angle between the pair of line:
$\vec{r}=3 \hat{i}+2 \hat{j}-4 \hat{k}+\lambda(\hat{i}+2 \hat{j}+2 \hat{k}), \vec{r}=5 \hat{i}-2 \hat{k}+\mu(3 \hat{i}+2 \hat{j}+6 \hat{k})$

## - Watch Video Solution

3. Find the angle between the following pair of lines: A lines with direction ratios $2,2,1 \mathrm{~A}$ line joning (3,1,4)to (7,2,12)

## - Watch Video Solution

4. Find the angle between the pair of lines $\frac{x+3}{3}=\frac{y-1}{5}=\frac{z+3}{4}$ and $\frac{x+1}{1}=\frac{y-4}{1}=\frac{z-5}{2}$.

## - Watch Video Solution

5. Find the angle between the pair of line:

$$
\vec{r}=4 \hat{i}=\hat{j}+\lambda(\hat{i}=2 \hat{j}-2 \hat{k}) \text { and } \vec{r}=\hat{i}-\hat{j}+2 \hat{k}-\mu(2 \hat{i}+3 \hat{j}-4 \hat{k})
$$

## - Watch Video Solution

6. Find the angle between the pair of line: $\vec{r}=(1-t) \hat{i}+(t-2) \hat{j}+(3-2 t) \hat{k}$ and $\vec{r}=(s+1) \hat{i}+(2 s-1) \hat{j}$

## Watch Video Solution

7. Find the equation of the line parallel to $2 \hat{i}-\hat{j}+3 \hat{k}$ and passing through the point (5,-2,4)

## - Watch Video Solution

8. Find the Cartesian and vector equations of a line which passes through the point $(1,2,3)$ and is parallel to the line $\frac{-x-2}{1}=\frac{y+3}{7}=\frac{2 z-6}{3}$

## - Watch Video Solution

9. Find the vector equation of the line through $A(3,4,-7) \operatorname{and} B(1,-1,6)$. Find also, its Cartesian equations.
10. The cartesian equation of a line is $\frac{x-5}{3}=\frac{y+4}{7}=\frac{z-6}{2}$. Write its vector form.

## - Watch Video Solution

11. find the vector equation of the line passing through the point $A(2,-1,1)$ and parallel to the ine joining the points $B(-1,4,1)$ and $C(1,2,2)$. Also find the Cartesian equation of the line.

## - Watch Video Solution

12. The Cartesian equation of a line are $3 x+1=6 y-2=1-z$. Find the direction ratios and write down its equation in vector form.
13. The Cartesian equations of a line are $6 x-2=3 y+1=2 z-2$.

Find its direction ratios and also find a vector equation of the line.

## Watch Video Solution

14. Find the equation of the line passing through the point $(-1,2,3)$
and perpendicular to the lines
$\frac{x}{2}=\frac{y-1}{-3}=\frac{z+2}{-2}$ and $\frac{x+3}{-1}=\frac{y+3}{2}=\frac{z-1}{3}$.

## - Watch Video Solution

15. Show that if the axes are rectangular the equation of line through point $\left(x_{1}, y_{1}, z_{1}\right)$ at right angle to the lines $\frac{x}{l_{1}}=\frac{y}{m_{1}}=\frac{z}{n_{1}}, \frac{x}{l_{2}}=\frac{y}{m_{2}}=\frac{z}{n_{2}}$ is
$\frac{x-x_{1}}{m_{1} n_{2}-m_{2} n_{1}}=\frac{y-y_{1}}{n_{1} l_{2}-n_{2} l_{1}}=\frac{z-z_{1}}{l_{1} m_{2}-l_{2} m_{1}}$

## - Watch Video Solution

16. Find coordinates of those points on the line $\frac{x-1}{2}=\frac{y+2}{3}=\frac{z+3}{6}$ which are at a distance of 3 units from points (1, - 2, 3)

## - Watch Video Solution

17. Find the coordinartes of the point where the line through $(3,4,1)$ and $(5,1,6)$ crosses $x y$-plane

## - Watch Video Solution

18. Find the equation of the line drawn through point $(1,0,2)$ to meet the line $\frac{x+1}{3}=\frac{y-2}{-2}=\frac{z 1}{-1}$ at right angles.

## - Watch Video Solution

$$
\begin{aligned}
& \text { 19. } \begin{array}{c}
\text { Show } \\
\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4} \text { and } \frac{x-4}{5}=\frac{y-1}{2}=z
\end{array} \begin{array}{ll}
\text { the } & \text { intersect. }
\end{array} \\
& \text { Find }
\end{aligned}
$$

also the point of intersection of these lines.

## - Watch Video Solution

$\begin{array}{ll}\text { 20. } & \text { Show } \\ \frac{x-5}{4}=\frac{y-7}{4}=\frac{z+3}{-5} \text { and } \frac{x-8}{7}=\frac{y-4}{1}=\frac{z-5}{3} & \text { intersect }\end{array}$ each other

## - Watch Video Solution

21. 

Show
that
the
lines
$\frac{x-1}{3}=\frac{y+1}{2}=\frac{z-1}{5}$ and $\frac{x-2}{4}=\frac{y-1}{3}=\frac{z+1}{-2} \quad$ do not intersect each other.

## Watch Video Solution

22. Find the perpendicular distance of the point $(1,0,0)$ from the lines $\frac{x-1}{2}=\frac{y+1}{-3}=\frac{z+10}{8}$
23. Find the coordinates of the foot of perpendicular from the point $(2,6,3)$ to the line $\frac{x}{2}=\frac{y-1}{2}=\frac{z-2}{3}$. Also find the equation of this perpendicular.

## - Watch Video Solution

24. Find the coordinates of the foot of the perpendicular drawn from the point $A(1,8,4)$ to the line joining the points $B(0,-1,3)$ and $C(2,-3,-1)$.

## - Watch Video Solution

25. Find the image of the point $(1,6,3)$ in the line $\frac{x}{1}=\frac{y-1}{2}=\frac{z-2}{3}$

## - Watch Video Solution

26. Find the shortest distance between the two lines whose vector
equations are given by:
$\vec{r}=\hat{i}+2 \hat{j}+3 \hat{k}+\lambda(2 \hat{i}+3 \hat{j}+4 \hat{k})$ and $\vec{r}=2 \hat{i}+4 \hat{j}+5 \hat{k}+\mu(3 \hat{i}+4$

## - Watch Video Solution

27. Find the shortest distance and the vector equation of the line of shortest distance between the lines given by $\vec{r}=3 \hat{i}+8 \hat{j}+3 \hat{k}+\lambda(3 \hat{i}-\hat{j}+\hat{k})$ and $\vec{r}=-3 \hat{i}-7 \hat{j}+6 \hat{k}+\mu(-3$

## - Watch Video Solution

28. Find the shortest distance between the two lines whose vector

$$
\begin{aligned}
& \text { equations are given } \\
& \vec{r}=(3-t) \hat{i}+(4+2 t) \hat{j}+(t-2) \hat{k} \text { and } \vec{r}=(1+s) \hat{i}+(3 s-7) \hat{j}+(\%
\end{aligned}
$$

## - Watch Video Solution

29. Find the shortest distance between the two lines whose vector equations are given by:
$\vec{r}=(1+\lambda) \hat{i}+(2-\lambda) \hat{j}+(-1+\lambda) \hat{k}$ and $\vec{r}=2(1+\mu) \hat{i}-(1-\mu) \hat{j}$

## - Watch Video Solution

30. Find the shortest distance between the lines $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-2}{3}=\frac{y-4}{4}=\frac{z-5}{5}$.

## - Watch Video Solution

31. Determine whether the following pair of lines intersect:
$\vec{r}=\hat{i}-\hat{j}+\lambda(2 \hat{i}+\hat{k})$ and $\vec{r}=2 \hat{i}-\hat{j}+\mu(\hat{i}+\hat{j}-\hat{k})$

## - Watch Video Solution

1. Find the angle between each of the following pair of line: $\vec{r}=5 \hat{i}-7 \hat{j}+\lambda(-\hat{i}+4 \hat{j}+2 \hat{k}) \vec{r}=-2 \hat{i}+\hat{k}+\mu(3 \hat{i}+3 \hat{k})$

## - Watch Video Solution

2. Find the angle between each of the following pair of line:
$\vec{r}=(2+s) \hat{i}+(s-1) \hat{j}+(2-3 s) \hat{k}, \vec{r}=(1-t) \hat{i}+(2 t+3) \hat{j}+\hat{k}$

## - Watch Video Solution

3. Find the angle between the following pairs of line: $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{6}, x+1=\frac{y+2}{2}=\frac{z-3}{2}$

## - Watch Video Solution

4. Find the angle between the following pairs of line:
$\frac{x+1}{3}=\frac{y-1}{5}=\frac{z+3}{4}, \frac{x+1}{1}=\frac{y-4}{4}=\frac{z-5}{2}$
5. Find the angle between the pair of lines $\frac{x+3}{3}=\frac{y-1}{5}=\frac{z+3}{4}$ and $\frac{x+1}{1}=\frac{y-4}{1}=\frac{z-5}{2}$.

## - Watch Video Solution

6. Find the angle between the line:
$\frac{x-3}{1}=\frac{y-2}{2}=\frac{z-2}{-4}$ and $\frac{x-0}{3}=\frac{y-5}{2}=\frac{z+2}{-6}$

## - Watch Video Solution

7. Find the angle between the line:
$\vec{r}=4 \hat{i}-\hat{j}+\lambda(\hat{i}+2 \hat{j}-2 \hat{k})$ and vevr $=\hat{i}-\hat{j}+2 \hat{k}-\mu(2 \hat{i}+4 \hat{j}-4 \hat{k}$

- Watch Video Solution

8. Show that line $\frac{x-3}{2}=\frac{y+1}{-3}=\frac{z-2}{4}$ is perpendicular to the line $\frac{x+2}{2}=\frac{y-4}{4}=\frac{z+5}{2}$

## - Watch Video Solution

9. If the lines $\frac{x-1}{-3}=\frac{y-2}{2 k}=\frac{z-3}{2}$ and $\frac{x-1}{3 k}=\frac{y-1}{1}=\frac{z-6}{-5}$ are perpendicular, find the value of $k$.

## - Watch Video Solution

10. Show that the line joining the origin to the point $(2,1,1)$ is perpendicular to the line determined by the points $(3,5,-1)$ and $(4,3,-1)$.

## - Watch Video Solution

11. If the coordinates of the points
$A, B, C, D b e 91,2,3),(4,5,7),(-4,3,-6)$ and $(2,9,2)$ respectively then find the angle between $A B$ and $C D$.

## - Watch Video Solution

12. Find the angle between the lines whose direction ratios are $a, b, c$ and $b-c, c-a, a-b$.

## - Watch Video Solution

13. Show that the three lines with direction cosines $\frac{12}{13},-\frac{3}{13},-\frac{4}{13}, \frac{4}{13}, \frac{12}{13}, \frac{3}{13}, \frac{3}{13},-\frac{4}{13}, \frac{12}{13} \quad$ are mutually perpendicular.

## - Watch Video Solution

14. Show that the line though the points $(4,7,8)$ and $(2,3,4)$ isparal $\leq l \rightarrow$ thel $\in$ ethroughthep $\oint s(-1,-2,1)$ and $(1,2,5)$.

## - Watch Video Solution

15. Show that the line though the points $(1,-1,2)$ and $(3,4,-2)^{\prime}$ is perpendicular to the line through the points ( $0,3,2$ ) andf ( $3,5,6$ ).

## - Watch Video Solution

16. Show that the line $\frac{x-5}{7}=\frac{y=2}{-5}=\frac{z}{1}$ and $\frac{x}{1}=\frac{y}{2}=\frac{z}{3}$ are perpendicular to each other.

## - Watch Video Solution

17. Find the angle between the following pair of line:
$\vec{r}=3 \hat{i}+\hat{j}-2 \hat{k}+\lambda(\hat{i}-\hat{j}-2 \hat{k})$ and $\vec{r}=2 \hat{i}-\hat{j}-56 \hat{k}+\mu(3 \hat{i}-5 \hat{j}$
18. Find the angle between the following pair of line: $r=2 \hat{i} \equiv 5 \hat{j}+\hat{k}+\lambda(3 \hat{i}+2 \hat{j}+6 \hat{k})$ and $\vec{r}=7 \hat{i}-6 \hat{k}+\mu(\hat{i}+2 \hat{j}+2 \hat{k}$,

## - Watch Video Solution

19. Find the angle between the following pair of lines $\frac{x}{2}=\frac{y}{2}=\frac{z}{1}$ and $\frac{x-5}{4}=\frac{y 2}{1}=\frac{z-3}{8}$

## - Watch Video Solution

20. Find the angle between the following pair of lines: (i)
$\frac{x-2}{2}=\frac{y-1}{5}=\frac{z+3}{-3}$ and $\quad \frac{x+2}{-1}=\frac{y-4}{8}=\frac{z-5}{4}$
$\frac{x}{2}=\frac{y}{2}=\frac{z}{1}$ and $\frac{x-5}{4}=\frac{y-2}{1}=\frac{z-3}{8}$

- Watch Video Solution

21. Find the values of p so that the lines $\frac{1-x}{3}=\frac{7 y-14}{2 p}=\frac{z-3}{2}$ and $\frac{7-7 x}{3 p}=\frac{y-5}{1}=\frac{6-z}{5}$ are at right angles.

## - Watch Video Solution

22. If $l_{1}, m_{1}, n_{1}$ and $l_{2}, m_{2}, n_{2}$ are the direction cosines of two mutually perpendicular lines, show that the direction cosines of the line perpendicular to both of these are $m_{1} n_{2}-m_{2} n_{1}, n_{1} l_{2}-n_{2} l_{1}, l_{1} m_{2}-l_{2} m_{1}$.

## - Watch Video Solution

23. The cartesian equation of a line is $\frac{x-5}{3}=\frac{y+4}{7}=\frac{z-6}{2}$. Write its vector form.

## - Watch Video Solution

24. Find the equation of the line passing through point $2 \hat{i}-\hat{j}+3 \hat{k}$ and parallel to vector $\hat{i}+\hat{j}-2 \hat{k}$ in vector form as well as Cartesian form.

## - Watch Video Solution

25. Findthe equation of the line passing through points $\hat{i}-2 \hat{j}+\hat{k}$ and $-2 \hat{j}+3 \hat{k}$ in vector form and Cartesian form.

## - Watch Video Solution

26. Find the euqation of the line passing through point (1,0,2) having direction ratios $3,-1,5$. Prove that this line passes through (4,-1,7)

## - Watch Video Solution

27. Find tehequation of the parallel to the line $\frac{x-2}{3}=\frac{y+1}{1}=\frac{z-7}{9}$ and passing through the point $(3,0,5)$.
28. Find the vector equation of a line passing thorugh a point with position vector $2 \hat{i}-2 \hat{j}+\hat{k}$ and parallel to the line joining the point with the position vectors $-\hat{i}+3 \hat{j}+\hat{k}$. Also find the Cartesian equation of this line.

## - Watch Video Solution

29. A line passes through the point with position vector $2 \hat{i}-\hat{j}+3 \hat{k}$ and is in the direction of $\hat{i}+\hat{j}-2 \hat{k}$. Find the equation of the line in vector and Cartesian forms.

## - Watch Video Solution

30. Find the vector equation of a line parallel to the vector $2 \hat{i}-\hat{j}+2 \hat{k}$ and passing through a point A with position vector $3 \hat{i}+\hat{j}-\hat{k}$.
31. Find the equation of the line (vector and Cartesian both) which is parallel to the vector $2 \hat{i}-\hat{j}+3 \hat{k}$ and which passes through the point (5,-2,4)

## - Watch Video Solution

32. The Cartesian equation of a line is ${ }^{\prime}(x-5) / 3=(y+4) / 7=(z-6) / 2$. find the vector equation of the line.

## - Watch Video Solution

33. Findthe vector equation of a straighat line which passes through the points whose position vector are $\hat{i}-2 \hat{j} j+\hat{k}$ and $3 \hat{k}-2 \hat{j}$.

## - Watch Video Solution

34. Find the vector equation of the straighat line passing through the point: ( $1,1,0$ ) and ( $0,1,1)^{`}$

## - Watch Video Solution

35. Find the vctor equation of the straighat line passing through the point: (-2,1,3) and (3,1,-2)

## - Watch Video Solution

36. Find the equation of a line parallel to $x$ axis and passing through the origin.

## - Watch Video Solution

37. Find the equation of the line which passes through the point $(1,2,3)$ and is parallel to the vector $3 \hat{i}+2 \hat{j}-2 \hat{k}$.
38. The Cartesian equation of a line is ${ }^{`}(x-5) / 3=(y+4) / 7=(z-6) / 2$. Write its vector equation.

## - Watch Video Solution

39. Find the vector and Cartesiasn equation of the line that passes through the origin and (5,-2,3).

## - Watch Video Solution

40. Find the vector equation for the line passing through the points $(1,0,2)$ and (3, 4, 6).

## - Watch Video Solution

41. The Cartesiasn equationof a line is $\frac{x+3}{2}=\frac{y-5}{4}=\frac{z+6}{2}$ Find its vector equation.

## - Watch Video Solution

42. Find the equation of the line in Cartesiasn form that passes through the point with positoin vector $2 \hat{i}-\hat{j}+4 \hat{k}$ and is in the direction $\hat{i}+2 \hat{j}-\hat{k}$.

## - Watch Video Solution

43. Find the point on the line $\frac{x+2}{3}=\frac{y+1}{2}=\frac{z-3}{2}$ at a distance of $3 \sqrt{2}$ from the point $(1,2,3)$.

## - Watch Video Solution

44. The distance of the point $(1,-2,3)$ from the plane $x-y+z=5$ measured parallel to the line $\frac{x}{2}=\frac{y}{3}=\frac{z}{-6}$, is

## (D) Watch Video Solution

45. Find the coordinates of the foot of perpendicular drawn from th point $A(1,8,4)$ to the line joining the points $B(0,-1,3) \operatorname{and} C(2-3,-1)$.

## - Watch Video Solution

46. Find the image of the point $(1,6,3)$ in the line $\frac{x}{1}=\frac{y-1}{2}=\frac{z-2}{3}$

## - Watch Video Solution

47. 2 / Find the perpendicular distance of the point $(1,0,0)$ from the line $\frac{x-1}{2}=\frac{y+1}{-3}=\frac{z+10}{8}$ Also, and the coordinates of the foot of the perpendicular and the equation of the perpendicular.
48. find the foot of perpendicular form $(0,2,7)$ to line $\frac{x+2}{-1}=\frac{y-1}{3}=\frac{z-3}{-2}$

## - Watch Video Solution

49. Find the foot and hence the lengh of perpendicular form $(5,7,3)$ to the line $\frac{x-15}{3}=\frac{y-29}{8}=\frac{z-5}{-5}$. Find also the equation of the perpendicular.

## - Watch Video Solution

50. Find the equation of the perpendicular drawn from $(2,4,-1)$ to the line $\frac{x+5}{1}=\frac{y+3}{4}=\frac{z-6}{3}$.
51. Find the length of the perpendicular from point $(3,4,5)$ on the line $\frac{x-2}{2}=\frac{y-3}{5}=\frac{z-1}{3}$.

## - Watch Video Solution

52. Find the length and the foot of the perpendicular drawn from the point $(2,-1,5)$ to the line $\frac{x-11}{10}=\frac{y+2}{-4}=\frac{x+8}{11}$

## - Watch Video Solution

53. Find the shortest distance between the following pair of line:
$\vec{r}=\hat{i}+\hat{j}+\lambda(2 \hat{i}-\hat{j}+2 \hat{k}), \vec{r}=2 \hat{i}+\hat{j}-\hat{k}+\mu(3 \hat{i}-5 \hat{j}+2 \hat{k})$

## - Watch Video Solution

54. Find the shortest distance between the following pair of line:
$\vec{r}=\hat{i}+2 \hat{j}+\hat{k}+\lambda(\hat{i}-\hat{j}+\hat{k})$ and $\vec{r}=2 \hat{i}-\hat{j}-\hat{k}+\mu(2 \hat{i}+\hat{j}+2 \hat{k})$

## - Watch Video Solution

55. Find the shortest distance between the following pair of line:

$$
\vec{r}=(1-t) \hat{i}+(t-2) \hat{j}+(3-2 t) \hat{k} \text { and } \vec{r}=(s+1) \hat{i}+(2 s-1) \hat{j}-(\dot{s}
$$

## - Watch Video Solution

56. Find the shortest distance between the following pair of line: $\vec{r}=\hat{i}+2 \hat{j}+3 \hat{k}+\lambda(\hat{i}-3 \hat{j}+2 \hat{k})$ and $\vec{r}=4 \hat{i}+5 \hat{j}+6 \hat{k}+\mu(2 \hat{i}+3 \hat{j}$

## - Watch Video Solution

57. Find the shortest distance between the following pair of line: $\vec{r}=\hat{i}+2 \hat{j}-4 \hat{k}+\lambda(2 \hat{i}+3 \hat{j}+6 \hat{k})$ and $\vec{r}=3 \hat{i}+3 \hat{j}-5 \hat{k}+\mu(2 \hat{i}+3$

## - Watch Video Solution

58. Find the shortest distance between the following lines: $\frac{x+1}{7}=\frac{y+1}{-6}=\frac{z+1}{1} ; \frac{3-x}{-1}=\frac{y-5}{-2}=\frac{z-7}{1}$

## - Watch Video Solution

59. Find the shortest distance between the lines
$\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-2}{3}=\frac{y-4}{4}=\frac{z-5}{5}$.

## - Watch Video Solution

60. Find the shortest distance between the lines
$\vec{r}=3 \hat{i}+5 \hat{j}+7 \hat{k}+\lambda(\hat{i}-2 \hat{j}+\hat{k})$ and $\vec{r}=-\hat{i}+\hat{j}-\hat{k}+\mu(2 \hat{i}-6 \hat{j}$

## - Watch Video Solution

61. The angle between a line $x=1, y=2$ and $y+1=0, z=0$ is (A) $0^{0}$
(B) $30^{0}$ (C) $60^{\circ}$ (D) $90^{0}$
62. The line $x=1, y=2$ is (A) parallel to $x$-axis (B) parallel to $y$-axis (C) parallel to $z$-axis (D) ies in a plane parallelto $x y$-plane.

## - Watch Video Solution

63. The lines $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-1}{3}=\frac{y-2}{4}=\frac{z-3}{5}$ are (A) parallel to $x$-axis (B) skew (C) intersecting (D) none of these

## - Watch Video Solution

64. The lines $6 x=3 y=2 z$ and $\frac{x-1}{-2}=\frac{y-2}{-4}=\frac{z-3}{-6}$ re (A) parallel (B) skew (C) intersecting (D) coincident

## - Watch Video Solution

65. The line $\frac{x-x_{1}}{0}=\frac{y-y_{1}}{1}=\frac{z-z_{1}}{2}$ is (A) parallel to x -axis perpendicular to $x$-axis (C) perpendiculat to YOZ plane (D) parallel to $y$ axis

## - Watch Video Solution

66. The line $x=x_{1}, y=y_{1}$ is (A) parallel to $x$-axis (B) parallel to $y$-axis (C) parallel to $z$-axis (D) parallel to XOY plane

## - Watch Video Solution

67. The equation of $y$-axis are (A) $x=0, y=0$ (B) $x=0, z=0$
$y=0, z=0$ (D) none of these

## - Watch Video Solution

68. The equations of the line through the point (alph, $\beta, \gamma$ ) and equally inclined to the axes are (A) $x-\alpha y-\beta=z-\gamma$
$\frac{x-1}{\alpha}=\frac{y-1}{\beta}=\frac{z-1}{\gamma}$ (C) $\frac{x}{\alpha}=\frac{y}{\beta}=\frac{z}{\gamma}$ (D) none of these

## - Watch Video Solution

69. The length of perpendicular from the poit (1, - 1, 2)onthel $\in e \frac{x+1}{2}=\frac{2-y}{3}=\frac{z+2}{4}$ is (A) 0 (B) $\sqrt{6}$ (C) $\sqrt{21}$
(D) none of these

## - Watch Video Solution

70. The coordinates of the foot of perpendicular form the point $A(1,1,1)$ on the lline joining ponts $B(1,4,6)$ and $C(5,4,4)$ are (A) $(3,4,5)(B)(4,5,3)(C)(3,-4,5)(D)(-3,-4,5)$

## - Watch Video Solution

71. The directionratios of the line which is perpendicular to the lines $\frac{x-7}{2}=\frac{y+17}{-3}=z-6$ and $x+5=\frac{y+3}{2}=\frac{z-4}{-2}$ are (A) $(4,5,7)$
(B) $(4,-5,7)$
(C) $(4,-5,-7)$
(D) $(-4,5,7)$

## - Watch Video Solution

72. The line $\vec{r}=\alpha(\hat{i}+\hat{j}+\hat{k})+3 \hat{k}$ and $\vec{r}=\beta(\hat{i}-2 \hat{j}+\hat{k})+3 \hat{k}$
(A) intersect at rilghat angles (B) are skew (C) are parallel (D) none of these

## - Watch Video Solution

73. The distance of the point $A(\vec{a})$ from the line $\vec{r}=\vec{b}+t \vec{c}$ is (A)

$$
\begin{equation*}
|(\vec{a}-\vec{b}) \times \vec{c}| \text { (B) } \frac{|(\vec{a}-\vec{b}) \times \vec{c}|}{|(\vec{a}-\vec{b})|} \text { (С) } \frac{|(\vec{a}-\vec{b}) \times \vec{c}|}{|\vec{c}|} \tag{D}
\end{equation*}
$$

$\underline{|\vec{a} \times(\vec{b}-\vec{c})|}$
$|\vec{a}|$
74. The length of perpendicular from the origin to the line $\vec{r}=(4 \hat{i}=2 \hat{j}+4 \hat{k})+\lambda(3 \hat{i}+4 \hat{j}-5 \hat{k})$ is (A) 2 (B) $2 \sqrt{3}$ (C) 6 (D) 7

## - Watch Video Solution

75. The shortest distance between the lines
$\vec{r}-\vec{a}+k \vec{b}$ and $\vec{r}=\vec{a}+l \vec{c}$ is ( $\vec{b}$ and $\vec{c}$ are non collinear) (A) 0
(B) $|\vec{b} \cdot \vec{c}|$ (C) $\frac{|\vec{b} \times \vec{c}|}{|\vec{a}|}$ (D) $\frac{|\vec{b} \cdot \vec{c}|}{|\vec{a}|}$

## - Watch Video Solution

76. The acute angle between the lines
$\vec{r}=(4 \hat{i}-\hat{j})+5(2 \hat{i}+\hat{j}-3 \hat{k})$ and $\vec{r}=(\hat{i}-\hat{j}+2 \hat{k})+t(\hat{i}-3 \hat{j}+2$
is (A) $\frac{3 \pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{2 \pi}{3}$ (D) $\frac{\pi}{6}$
$\square$
