

1. (b) ; gk $a = \sqrt{4+4+1} = \sqrt{9}$, $b = \sqrt{1+4+4} = \sqrt{9}$ 0
 $c = \sqrt{1+16+1} = \sqrt{18}$

Li"Vr%] ; g ledks.kh; lef]ckgq f=Hkqt gSA

2. (d) $\frac{-4+1}{5+4} = \frac{2-3}{5-2} = \frac{-2-2}{\lambda+2}$; k $\lambda+2=12$; k $\lambda=10$.

3. (b) l ery ds vfHkyEc ds fnd- vuq kr (2, 3, -6) gA

\therefore fnd- dkt ; k ; $\left(\frac{2}{\sqrt{49}}, \frac{3}{\sqrt{49}}, -\frac{6}{\sqrt{49}}\right)$; k $\left(\frac{2}{7}, \frac{3}{7}, -\frac{6}{7}\right)$

gA

4. (b) $x = \frac{-5+9}{-2} = -2$, $y = \frac{-5(2)+3(-5)}{-2} = \frac{25}{2}$

$z = \frac{-5(3)+3(6)}{-2} = -\frac{3}{2}$.

5. (c) ey fclnq l snjh $= \sqrt{1+4+9} = \sqrt{14}$
rFk y-v{k l snjh $= \sqrt{1+9} = \sqrt{10}$.

6. (a) pfd $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma = 1$
 $\Rightarrow \Sigma \sin^2 \alpha = 3 - 1 = 2$.

7. (a) $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma = 1$

$\Rightarrow \cos \gamma = \sqrt{1 - \left(\frac{14}{15}\right)^2 - \left(\frac{1}{3}\right)^2} = \sqrt{\frac{8}{9} - \left(\frac{196}{225}\right)} = \pm \frac{2}{15}$

8. (d) ; g Li"V gA

9. (c) $d = \sqrt{1+4+1} = \sqrt{6}$.

10. (a) fnd-dkt ; k ; $\left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right)$ gA

11. (b) x-v{k l snjh $= \sqrt{y^2+z^2} = \sqrt{4+9} = \sqrt{13}$

y-v{k l snjh $= \sqrt{1+9} = \sqrt{10}$

z-v{k l snjh $= \sqrt{1+4} = \sqrt{5}$.

12. (c) $0 = \frac{a-2+4}{3} \Rightarrow a = -2$, $0 = \frac{1+b+7}{3} \Rightarrow b = -8$

$0 = \frac{3-5+c}{3} \Rightarrow c = 2$.

13. (c) fodYi (c) ds ijh{k.k l s $\frac{4-(-2)}{-3-4} \neq \frac{-3-4}{-2-(-3)}$

vr%bu fclnq/kadk l ey vl ejf]kh; gA

14. (c) ; gk $\cos \alpha = \cos \beta = \cos \gamma$

$\therefore 3 \cos^2 \alpha = 1 \Rightarrow \alpha = \cos^{-1}\left(\pm \frac{1}{\sqrt{3}}\right)$.

15. (d) $\cos \gamma = \sqrt{1 - \frac{3}{4} - \frac{1}{2}} = \sqrt{\frac{-1}{4}}$, tksfd l Etko ugha gA

16. (d) $l(1) + m(0) + n(2-1) = 0 \Rightarrow l + n = 0$

$0 = l(-2) + m(1) + n(-4) = 0 \Rightarrow 2l - m + 4n = 0$

$\therefore l = -\frac{m}{2} = -n$.

vr%fnd-vuq kr (1, -2, -1) gA

17. (b) fnd-dkt ; k ; $\left[\frac{2}{\sqrt{2^2+(-3)^2+6^2}}, \frac{-3}{\sqrt{49}}, \frac{6}{\sqrt{49}}\right]$; k

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

18. (d) jf]kkvka PQ o RS ds chp dksk Kkr djus ij ikrs gA fd u rls PQ || RS vj] uk gh $PQ \perp RS$ l kfk gh $PQ \neq RS$.

19. (a) pfd AB o CD ij Lij yEcor-gA vr% AB dk CD ij c{k i 0 $\frac{1}{2}$ k; $\frac{1}{2}$ gkskA

20. (b) $a_1a_2 + b_1b_2 + c_1c_2 = 0$, vr% $OP \perp OQ$.

21. (a) $r = \sqrt{4+1+4} = 3$.

22. (b) vuq kr $= -\left(\frac{5}{-2}\right) = \frac{5}{2}$, vfHkr $\sim 5 : 2$.

23. (b) $\left[\frac{2+1}{1}, \frac{4-0}{1}, \frac{-2-1}{1}\right] = (3, 4, -3)$.

24. (b) xy-ry ds fy ; $z=0 \Rightarrow \frac{6\lambda+1}{\lambda+1} = 0 \Rightarrow \lambda = -\frac{1}{6}$

$\therefore x = \frac{-5+18}{5} = \frac{13}{5}$, $y = \frac{-1+24}{5} = \frac{23}{5}$.

25. (a) ; gk $x_2 - x_1 = 6$, $y_2 - y_1 = 6$, $z_2 - z_1 = 4$ vj] x, y, z -v{kka dh fnd- dkt ; k ; Δ e'k% (1,0,0), (0,1,0), (0,0,1) gA

vr% c{k i $= (x_2 - x_1)l + (y_2 - y_1)m + (z_2 - z_1)n$

\therefore jf]kk AB dk funkkacl v{kka ij c{k i Δ e'k% 6, 6, 4 gA

26. (c) ; g Li"V gA

27. (b) ; gk $\cos^2 \alpha + \cos^2(90 - \alpha) + \cos^2 \gamma = 1$

$\Rightarrow \cos^2 \alpha + \sin^2 \alpha + \cos^2 \gamma = 1$

$\Rightarrow \cos^2 \gamma + 1 = 1 \Rightarrow \gamma = 90^\circ$.

28. (a) ; gk $\frac{(3-(-2))}{1-3} = \frac{-6-4}{-2-(-6)} = \frac{-8-7}{-2-(-8)}$

$\Rightarrow -\frac{5}{2} = -\frac{5}{2} = -\frac{5}{2}$. Li"Vr%fclnq l ejf]kh; gA

29. (a) ekuk fclnq C, jf]kk AB dks 1 : λ ds vuq kr ea folHkr t r

djrk gA $\therefore 5 = \frac{9\lambda+3}{\lambda+1} \Rightarrow 4\lambda = 2 \Rightarrow \lambda = \frac{1}{2}$

vr%vfHkr"V vuq kr 2 : 1 gA

30. (a) fnd-dkt ; k ; $\left(\frac{4}{\sqrt{16+36+144}}, \frac{6}{14}, \frac{12}{14}\right)$; k

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

31. (b) ekuk P(x, y, z) - vc c'ukud kj]

$\left[\sqrt{x^2+y^2}\right]^2 + \left[\sqrt{y^2+z^2}\right]^2 + \left[\sqrt{z^2+x^2}\right]^2 = 36$

$\Rightarrow x^2 + y^2 + z^2 = 18$

rc] ey fclnq l fclnq(x, y, z) dh njh

$= \sqrt{x^2 + y^2 + z^2} = \sqrt{18} = 3\sqrt{2}$.

32. (a) c'ukud kj, $\frac{a+2}{6} = \frac{b-1}{2} = \frac{c+8}{3}$

$\Rightarrow a = 4, b = 3, c = -5$.

33. (b) find- vuqkr $l = 4 - (-2) = 6, \quad m = 3 - 1 = 2 \quad 0$
 $n = -5 + 8 = 3$ gA

34. (a) vuqkr $= -\left(\frac{3}{-2}\right) = \frac{3}{2}$
 \therefore vHkV funzkkd
 $= \left[\frac{6-6}{5}, \frac{10+3}{5}, \frac{-14+24}{5}\right] = \left(0, \frac{13}{5}, 2\right)$.

35. (a) ekuk fclnq (x, y, z) gA rks $x^2 + y^2 + z^2$
 $=$
 $(x-a)^2 + y^2 + z^2 = x^2 + (y-b)^2 + z^2 = x^2 + y^2 + (z-c)^2$
 vr% $x = \frac{a}{2}, y = \frac{b}{2} \quad 0 \quad z = \frac{c}{2}$.

36. (b) Li "Vr% c(ki $= [2 - (-1)]\frac{6}{7} + [5 - 0]\frac{2}{7} + [1 - 3]\frac{6}{7}$
 $= \frac{18 + 10 - 6}{7} = \frac{22}{7}$.

37. (b) ekuk $A = (1, 1, 1); B = (-2, 4, 1); C = (-1, 5, 5) \quad 0$
 $D = (2, 2, 5)$
 $AB = \sqrt{9 + 9 + 0} = 3\sqrt{2}, \quad BC = \sqrt{1 + 1 + 16} = 3\sqrt{2} \quad 0$
 $CD = 3\sqrt{2} \quad 0 \quad AD = 3\sqrt{2}$. vr%; g , d oxl gA

38. (a) ekuk j[kk; agA $l_1x + m_1y + n_1z + d = 0$ (i)
 $0 \quad l_2x + m_2y + n_2z + d = 0$ (ii)
 ; fn $lx + my + nz + d = 0$, (i) o (ii) ij yfc gA
 rks $ll_1 + mm_1 + nn_1 = 0, ll_2 + mm_2 + nn_2 = 0$
 $\Rightarrow \frac{l}{m_1n_2 - m_2n_1} = \frac{m}{n_1l_2 - l_1n_2} = \frac{n}{l_1m_2 - l_2m_1} = d$
 vr% fnd-dk[; k; a
 $(m_1n_2 - m_2n_1), (n_1l_2 - l_1n_2), (l_1m_2 - l_2m_1)$ gA

39. (b) $\cos 2\alpha + \cos 2\beta + \cos 2\gamma$
 $= 2\cos^2 \alpha - 1 + 2\cos^2 \beta - 1 + 2\cos^2 \gamma - 1$
 $= 2(\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma) - 3 = 2 - 3 = -1$.

40. (a) vHkV njh $= \sqrt{3^2 + 5^2} = \sqrt{34}$.

41. (b) pfd rhuks j[kk; a ijLij yEcor-gA
 $\therefore l_1l_2 + m_1m_2 + n_1n_2 = 0$
 $l_2l_3 + m_2m_3 + n_2n_3 = 0$
 $l_3l_1 + m_3m_1 + n_3n_1 = 0$

l kFk ghj
 $l_1^2 + m_1^2 + n_1^2 = 1, l_2^2 + m_2^2 + n_2^2 = 1, l_3^2 + m_3^2 + n_3^2 = 1$
 $(l_1 + l_2 + l_3)^2 + (m_1 + m_2 + m_3)^2 + (n_1 + n_2 + n_3)^2$
 $= (l_1^2 + m_1^2 + n_1^2) + (l_2^2 + m_2^2 + n_2^2) + (l_3^2 + m_3^2 + n_3^2)$
 $+ 2(l_1l_2 + m_1m_2 + n_1n_2) + 2(l_2l_3 + m_2m_3 + n_2n_3)$
 $+ 2(l_3l_1 + m_3m_1 + n_3n_1) = 3$

\Rightarrow
 $(l_1 + l_2 + l_3)^2 + (m_1 + m_2 + m_3)^2 + (n_1 + n_2 + n_3)^2 = 3$
 vr: vHkV j[kk dh fnd-dk[; k; a
 $\left(\frac{l_1 + l_2 + l_3}{\sqrt{3}}, \frac{m_1 + m_2 + m_3}{\sqrt{3}}, \frac{n_1 + n_2 + n_3}{\sqrt{3}}\right)$ gA

ulV : foH kFkZ bl srF; l e>dj ; kn j [kA

42. (b) x-v(k dk l ehdj .k $y = 0, z = 0$. vr%yo z fu; r jgkA

43. (b) pfd j[kk dh fnd-dk[; k; a $\left(\frac{1}{c}, \frac{1}{c}, \frac{1}{c}\right)$ gA
 $\therefore \frac{1}{c^2} + \frac{1}{c^2} + \frac{1}{c^2} = 1 \Rightarrow c^2 = 3 \Rightarrow c = \pm\sqrt{3}$.

44. (d) pfd ZOx l ery vFkZ- $y = 0$ fclnq/ka $(1, -1, 5)$ rFk
 $(2, 3, 4)$ dks tkMus okyh j[kk dks $\lambda : 1$ ea foHk[tr djrk
 gA
 vr% $\frac{3\lambda - 1}{\lambda + 1} = 0 \Rightarrow \lambda = \frac{1}{3}$.

45. (d) vHkV fnd-dk[; k; a
 $\frac{3}{\sqrt{3^2 + 12^2 + 4^2}}, \frac{12}{\sqrt{3^2 + 12^2 + 4^2}}, \frac{4}{\sqrt{3^2 + 12^2 + 4^2}}$
 vFkZ- $\frac{3}{13}, \frac{12}{13}, \frac{4}{13}$ gA