MATHS

BOOKS - MARVEL MATHS (HINGLISH)

LINE IN SPACE

Multiple Choice Questions

1. Equations of the passing through the point $(0, 1, 2)$ and equally inclined to the co - ordinates axes are ,

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

B. $\frac{x}{0} = \frac{y}{1} = \frac{z}{2}$

C. $\frac{0}{x} = \frac{1}{y} = \frac{2}{z}$

D. $x = y - 1 = z - 2$

Answer: D

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2. A line passing a given point $A(x_1, y_1, z_1)$ has direction cosines l,m,n If is a point on the line such that AP = r then the co ordinates of P are .

A. $\left(\frac{x_1}{r}, \frac{y_1}{r}, \frac{z_1}{r}\right)$

B. $(x_1 + lr, y_1 + mr, z_1 + nr)$

C. $(x_1 - lr, y_1 - mr, z_1 - nr)$

D. (rx_1, ry_1, rz_1)

Answer: B

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3. Equations of the line joining $(2, -3, 1)$ and $(3, -4, -5)$ are

A. $\frac{x-2}{3} = \frac{y+3}{-4} = \frac{z-1}{-5}$

B. $\frac{x-3}{2} = \frac{y+4}{-3}\frac{z+5}{1}$

C. $2 - x = y + 3 = \frac{z-1}{6}$

D. $\frac{x-2}{3} = \frac{y+4}{-3} = \frac{z-1}{-1}$

Answer: C

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4. Equations of the line passing through $(1, 2, 3)$ and $(-3, 4, 3)$ are

A. $\frac{x-1}{-4} = \frac{y-2}{-2} = \frac{z-3}{0}$

B. $\frac{x-1}{-4} = \frac{y-2}{-2}$

C. $\frac{x-1}{2} = 2 - y = \frac{z-3}{0}$

D. $\frac{x-2}{-3} = \frac{y-4}{2} = \frac{z-3}{3}$

Answer: C

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5. Equations of the line passing through (a,b,c) and parallel to Z - axis , are

A. $x - a = y - b = z$

B. $\frac{x-a}{0} = \frac{y-b}{0} = \frac{z-c}{1}$

C. $\frac{x-a}{1} = \frac{y-b}{1} = \frac{z-c}{0}$

D. $x - a = y - b = z - c$

Answer: B

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6. Equations of the line passing through (a,b,c) and perpendicular to Z - axis are

A. $\frac{x-a}{l}=\frac{y-b}{m}=\frac{z-c}{0}$

B. $\frac{x-a}{0}=\frac{y-b}{0}=\frac{z-c}{abc}$

C. $\frac{x-a}{a}=\frac{y-b}{b}=z$

D. $\frac{x-l}{a}=\frac{y-m}{b}=\frac{z-n}{c}$

Answer: A

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7. Line $\frac{x-2}{-2}=\frac{y+1}{-3}=\frac{z-5}{1}$ intersects the plane $3x+4y+z=3$ in the point

A. $\left(\frac{23}{7},\frac{29}{7},\frac{38}{7}\right)$

B. $\left(\frac{29}{7}, \frac{38}{7}, \frac{23}{7}\right)$

C. $\left(\frac{26}{17}, -\frac{29}{17}, \frac{89}{17}\right)$

D. $(1, 2, 8)$

Answer: C

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8. Equations of the line passing through the origin and the point (a,b,c) are

A. $\frac{x-a}{x-0} = \frac{y-b}{y-0} = \frac{z-c}{z-0}$

B. $\frac{x-a}{a} = \frac{y-b}{b} = \frac{z-c}{c}$

C. $\frac{x-a}{b-c} = \frac{y-b}{c-a} = \frac{z-c}{a-b}$

D. $a(x-a) = b(y-b) = c(z-c)$

Answer: B

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9. Equations of the line passing through $(-1, 2, -3)$ and parallel to the line $\frac{x-2}{3} = \frac{y+1}{-5} = \frac{z+3}{-7}$ are

A. $\frac{x-1}{3} = \frac{y+2}{-5} = \frac{z-3}{-7}$

B. $\frac{x+1}{3} = \frac{y-2}{-5} = \frac{z+3}{-7}$

C. $\frac{x+1}{-3} = \frac{y-2}{-5} = \frac{z+3}{7}$

D. $3(x-1) = 5(y+1) = -7(z+3)$

Answer: B

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10. Equations of the line through $(4, -5, 6)$ and perpendicular to the lines $\frac{x-11}{1} = \frac{y+6}{-3} = \frac{z-5}{0}$ and $\frac{x-1}{5} = \frac{y-2}{2} = \frac{z-8}{11}$ are

A. $\frac{x-1}{3} = \frac{y-2}{2} = \frac{z-8}{11}$

B. $\frac{x-4}{-33} = \frac{y+5}{-11} = \frac{z-6}{17}$

C. $\frac{x-4}{3} = \frac{y+5}{1} = \frac{y-6}{-17}$

D. $3(x-4) - 3(y+5) + 11(z-6) = 0$

Answer: B

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11. Line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ intersects the plane $3x + 6y + 5z = 0$ in the point A . Then the direction ratios of the line OA are

A. $1, 6, -8$

B. $8, 6, -1$

C. $6, 8, 1$

D. $8, 1, -6$

Answer: D

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12. The point at which the line joining the points $(2, -3, 1)$ and $(3, -4, -5)$ intersects the plane $2x + y + z = 7$ is

A. $(1, 2, -7)$

B. $(1, -2, 7)$

C. $(-1, 2, 7)$

D. $(1, 2, 7)$

Answer: B

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13. Distance of the points of intersection of the line $\frac{x-3}{1} = \frac{y-4}{2} = \frac{z-5}{2}$ and plane $x + y + z = 2$ from the point (3,4,5) is

A. 0

B. 6

C. 13

D. 7

Answer: B

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14. Distance from the point $(-3, 2, 5)$ to the point where the line $\frac{x+3}{2} = \frac{y-2}{2} = \frac{z-5}{2}$ meets the plane $x + y + 2z = 3$ is

A. $\frac{7}{18}$

B. $\frac{8}{17}$

C. $\frac{17}{8}$

D. $\frac{18}{7}$

Answer: D

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15. Distance of the point of intersection of the line $\frac{x-2}{3} = \frac{y+1}{4} = \frac{z-2}{12}$ and the plane $x - y + z = 5$ from the point $(-1, -5, -10)$ is

A. 0

B. 3

C. 31

D. 13

Answer: D

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16. Distance of the point $(1, -2, 3)$ from the plane $x - y + z = 5$ measured parallel to the line whose direction cosines are proportional to $2, 3, -6$ is

A. 1

B. 2

C. 3

D. 4

Answer: A

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17. Co - ordinates of the foot of the perpendicular drawn from the origin to the plane $2x + 3y - 4z + 1 = 0$ are

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

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

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

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

Answer: C

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

A. $3x + 4y + 5z = 8$

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

C. $x + y - z = 2$

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

Answer: D

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19. If the line $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies exactly on the plane $2x - 4y + z = 7$, the value of k is

A. 7

B. -7

C. no real values

D. 4

Answer: A

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20. Equation of the plane containing the line $L_1 : \frac{x-1}{3} = \frac{y+6}{4} = \frac{z+1}{2}$, parallel to the line $L_2 : \frac{x-2}{2} = \frac{y-1}{-3} = \frac{z+4}{5}$, is $26x - 11y - 17z$ = p where : p =

A. 109

B. 110

C. 111

D. 112

Answer: A

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21. Prove that the lines $3x + 2y + z - 5 = 0 = x + y - 2z - 3$ and $2x - y - z = 0 = 7x + 10y - 8z - 15$ are perpendicular

A. 0°

B. 30°

C. 60°

D. 90°

Answer: D

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22. Equation of the plane E which contains the line $L: x = \frac{y-3}{2} = \frac{z-5}{3}$, and is perpendicular to the plane , $E_1: 2x + 7y - 3z = 1$ is

A. $9x - 3y - z = 14$

B. $9x - 3y + z = 14$

C. $9x - 3y - z + 14 = 0$

D. $9x + 3y + z = 14$

Answer: C

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23. Find the equation of the plane which contains two parallel to lines $\frac{x-4}{1} = \frac{y-3}{-4} = \frac{z-2}{5}$ *and* $\frac{x-3}{1} = \frac{y+2}{-4} = \frac{z}{5}$.

A. $11x - y - 3z = 35$

B. $11x - y + 3z = 35$

C. $11x + y - 3z = 35$

D. $11x + y + 3z = 53$

Answer: A

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24. Find ten equation of the plane passing through the point $(0, 7, -7)$ and containing the line $\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z+2}{1}$.

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

B. $y + z = 0$

C. $x + y + z = 0$

D. $x + 2y + z = 7$

Answer: C

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25. Foot of the perpendicular drawn from the origin to the line $x-2=\frac{y+3}{-2}=z$ is point

A. $\left(\frac{2}{3}, \frac{1}{3}, -\frac{4}{3}\right)$

B. $\left(\frac{2}{3}, -\frac{1}{3}, -\frac{4}{3}\right)$

C. $\left(-\frac{2}{3}, \frac{1}{3}, -\frac{4}{3}\right)$

D. $(2, -1, -4)$

Answer: B

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26. Foot of the perpendicular drawn from the point $(3, -1, 11)$ to the $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ is the point

A. $(3, 5, 7)$

B. $(0, 2, 3)$

C. $(2, 3, 4)$

D. $(2, 5, 7)$

Answer: D

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27. Find the distance of the point $P(3, 8, 2)$ from the line $\frac{1}{2}(x-1) = \frac{1}{4}(y-3) = \frac{1}{3}(z-2)$ measured parallel to the plane $3x + 2y - 2z + 15 = 0$.

A. 4

B. 7

C. 8

D. 5

Answer: B

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28. Show that the lines $\frac{x5}{4}, \frac{y-7}{4} = \frac{z+3}{-5}$ and $\left)x - 8\frac{)}{7} = \frac{y-4}{1} = \frac{z-5}{3}$ intersect each other

A. $(1, 2, 3)$

B. $(1, 3, 2)$

C. $(2, 3, 1)$

D. $(3, 2, 1)$

Answer: B

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29. Lines $\frac{x+1}{-3} = \frac{y-3}{2} = z+2$ and $x = \frac{x-7}{-3} = \frac{z+7}{2}$ lie in the plane

A. $x - 2y + z + 7 = 0$

B. $x + 2y - z + 7 = 0$

C. $x + y + z = 0$

D. $x + 2y + z = 7$

Answer: C

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30. Lines $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ lie on the plane

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

B. $x-2y+z+7=0$

C. $x+y+z=0$

D. $x+y+z=9$

Answer: A

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31. A plane II makes intercept 3 and 4 respectively on x and z axes.

If II is parallel to y-axis, then its equation is

A. $4x+3z=12$

B. $3x + 4z = 12$

C. $3y + 4z = 12$

D. $4y + 3z = 12$

Answer: A

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32. A vector $\vec{r}$ is equally inclined with the coordinates axes. If the tip of $\vec{r}$ is in the positive octant and $\left|\vec{r}\right| = 6$, then $\vec{r}$ is

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

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

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

D. $2\sqrt{i + j + k}$

Answer: D

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33. If the two lines $\frac{x-1}{-3}=\frac{y-2}{2m}=\frac{z-3}{2}$ and $\frac{x-1}{3m}=\frac{y-5}{1}=\frac{z-6}{-5}$ are mutually perpendicular , then : m

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

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

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

D. $\frac{10}{7}$

Answer: C

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34. Find the two points on the line $\frac{x-2}{1}=\frac{y+3}{-2}=\frac{z+5}{2}$ on either side of $(2,\ -3,\ -5)$ which are at a distance of 3 units from it.

A. $(3, 5, 3), (1, 1, 7)$

B. $(3,\ -5,\ -3), (1,\ -1,\ -7)$

C. $(-3,\ -5, 3), (-1,\ -1, 7)$

D. $(-3, 5, 3), (1, 1,\ -7)$

Answer: B

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35. Equations of the line of intersection of the two planes y = b , z = c in the symmetrical form are

A. $\frac{x}{0}=\frac{y-b}{0}=\frac{z-c}{0}$

B. $\frac{x}{1} = \frac{y-1}{0} = \frac{z-c}{0}$

C. $\frac{x}{1} = \frac{y}{b} = \frac{z}{0}$

D. $ax = by = cz$

Answer: B

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36. Find the coordinates of the 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 the point (-1 , 2 , -3).

A. $\left(\frac{1}{7}, \frac{23}{7}, \frac{3}{7}\right), \left(\frac{13}{7}, \frac{5}{7}, \frac{39}{7}\right)$

B. $\left(\frac{-1}{7}, \frac{23}{7}, \frac{-3}{7}\right), \left(\frac{-13}{7}, \frac{6}{7}, \frac{-39}{7}\right)$

C. $\left(\frac{1}{7}, \frac{-23}{7}, \frac{3}{7}\right), \left(\frac{13}{7}, \frac{-5}{7}, \frac{39}{7}\right)$

D. none of these

Answer: B

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37. Find the two points on the line $\frac{x-2}{1}=\frac{y+3}{-2}=\frac{z+5}{2}$ on either side of $(2,\ -3,\ -5)$ which are at a distance of 3 units from it.

A. $(3,\ -5,\ -3)(1,\ -1,\ -7)$

B. $(3,5,3)(1,1,7)$

C. $(-3,5,3)(-1,1,7)$

D. none of these

Answer: A

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38. Shortest distance between the lines $\bar{r}(2i-j)+\lambda(2i+j-3k)$ and $\bar{r}=(i-j+2k)+\mu(2i+j-5k)$ is

A. $\frac{3}{\sqrt{20}}$

B. $\frac{1}{\sqrt{5}}$

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

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

Answer: B

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39. Shortest distance between the lines $\bar{r}=(1,2,1)+\lambda(1,-1,1)$ and $\bar{r}=(2,-1,-1)+\mu(2,1,2)$ is

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

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

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

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

Answer: C

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40. The two lines $\bar{r} = (1, 1, -1) + \lambda(3, -1, 0)$ and $\bar{r} = (4, -1, 0) + \mu(2, 0, 3)$ are

A. parallel

B. intersecting

C. non-coplanar

D. none of these

Answer: C

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41. Length of perpendicular from the point $(3, 2, 1)$ to the line $\frac{x-7}{2} = \frac{y-7}{-2} = \frac{z-6}{-3}$ is

A. $\sqrt{46}$

B. $\sqrt{47}$

C. $\sqrt{48}$

D. $\sqrt{49}$

Answer: D

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42. The angle between the lines $\frac{x-4}{1}=\frac{y-3}{1}=\frac{z-2}{2}$,

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

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

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

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

Answer: C

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43. If $P(5, 6, -1), Q(2, -7, \beta)$ and $R(-1, -20, 7)$ are collinear , then $\beta =$

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

B. 2

C. 3

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

Answer: C

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44. Find the point where the line $\frac{x-1}{2} = \frac{y-2}{-3} = \frac{z+3}{4}$ meets the plane $2x + 4y - z = 1$.

A. $(3, -1, 1)$

B. $(3, 1, 1)$

C. $(1, 1, 3)$

D. $(1, 3, 1)$

Answer: A

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