



23. 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

(1) $2\sqrt{14}$

(2) 8

(3) $3\sqrt{21}$

(4) 13

Answer:

Let $\frac{x-2}{3} = \frac{y+1}{4} = \frac{z-2}{12} = \lambda$ therefore point $A(3\lambda + 2, 4\lambda - 1, 12\lambda + 2)$.

Since A lies on the plane $x - y + z = 16$ therefore

$$3\lambda + 2 - (4\lambda - 1) + 12\lambda + 2 = 16 \text{ or } 11\lambda = 11 \text{ or } \lambda = 1, \text{ therefore } A(5, 3, 14)$$

Now distance between $A(5, 3, 14)$ and $(1, 0, 2) = \sqrt{(5-1)^2 + 3^2 + (14-2)^2} = \sqrt{169} = 13$

Correct option is (4) 13