

Worksheet: Parametric Equations of a Straight Line in Space



Q1: Write the equation of the straight line L passing through the points $P_1 = (4, 1, 5)$ and $P_2 = (-2, 1, 3)$ in parametric form.

A $x = 6 + 4t, y = 1, z = 5 + 2t$, for $-\infty < t < \infty$

B $x = 4 - 6t, y = 1, z = 5 - 2t$, for $-\infty < t < \infty$

C $x = 4 + 2t, y = 1 + t, z = 5 + 3t$, for $-\infty < t < \infty$

D $x = -2 + 6t, y = 1 + t, z = 3 + 2t$, for $-\infty < t < \infty$

E $x = -2 - 6t, y = 1, z = 3 - 2t$, for $-\infty < t < \infty$

Q2: Which of the following are the parametric equations of the line through point $A(-8, 8)$ with a direction perpendicular to vector $\mathbf{u} = \langle -6, 7 \rangle$?

A $x = -8 - 6K, y = 8 + 7K$

B $x = -8 + 7K, y = 8 + 6K$

C $x = -8 + 8K, y = -6 + 7K$

D $x = -8 + 7K, y = 8 - 6K$

Q3: Which of the following are the parametric equations of the line through point $A(7, -8)$ with a direction perpendicular to vector $\mathbf{u} = \langle -10, 4 \rangle$?

A $x = 7 - 10K, y = -8 + 4K$

B $x = 7 + 4K, y = -8 + 10K$

C $x = 7 - 8K, y = -10 + 4K$

D $x = 7 + 4K, y = -8 - 10K$

Q4: Which of the following are the parametric equations of the line through point $A(-1, -5)$ with a direction perpendicular to vector $\mathbf{u} = \langle -2, -1 \rangle$?

A $x = -1 - 2K, y = -5 - K$

B $x = -1 - K, y = -5 + 2K$

C $x = -1 - 5K, y = -2 - K$

D $x = -1 - K, y = -5 - 2K$

Q5: Which of the following are the parametric equations of the line through point $A(-9, -10)$ with a direction perpendicular to vector $\mathbf{u} = \langle 2, -3 \rangle$?

A $x = -9 + 2K, y = -10 - 3K$

B $x = -9 - 3K, y = -10 - 2K$

C $x = -9 - 10K, y = 2 - 3K$

D $x = -9 - 3K, y = -10 + 2K$

Q6: Which of the following are the parametric equations of the line through point $A(-6, -3)$ with a direction perpendicular to vector $\mathbf{u} = \langle 6, 10 \rangle$?

A $x = -6 + 6K, y = -3 + 10K$

B $x = -6 + 10K, y = -3 - 6K$

C $x = -6 - 3K, y = 6 + 10K$

D $x = -6 + 10K, y = -3 + 6K$

Q7: Which of the following are the parametric equations of the line through point $A(-5, 7)$ with a direction perpendicular to vector $\mathbf{u} = \langle 8, 2 \rangle$?

A $x = -5 + 8K, y = 7 + 2K$

B $x = -5 + 2K, y = 7 - 8K$

C $x = -5 + 7K, y = 8 + 2K$

D $x = -5 + 2K, y = 7 + 8K$

Q8: Which of the following are the parametric equations of the line through point $A(7, -10)$ with a direction perpendicular to vector $\mathbf{u} = \langle 6, -1 \rangle$?

A $x = 7 + 6K, y = -10 - K$

B $x = 7 - K, y = -10 - 6K$

C $x = 7 - 10K, y = 6 - K$

D $x = 7 - K, y = -10 + 6K$

Q9: Which of the following are the parametric equations of the line through point $A(8, 9)$ with a direction perpendicular to vector $\mathbf{u} = \langle -6, -1 \rangle$?

A $x = 8 - 6K, y = 9 - K$

B $x = 8 - K, y = 9 + 6K$

C $x = 8 + 9K, y = -6 - K$

D $x = 8 - K, y = 9 - 6K$

Q10: Find the parametric equations of the straight line $\frac{3x - 7}{-9} = \frac{8y - 3}{4} = \frac{-8 - 6z}{-9}$.

A $x = \frac{7}{3} - 3t, y = \frac{3}{8} + \frac{1}{2}t, z = -\frac{4}{3} + \frac{3}{2}t$

B $x = \frac{3}{7} - \frac{1}{3}t, y = \frac{8}{3} + 2t, z = -\frac{3}{4} + \frac{2}{3}t$

C $x = -3 + \frac{7}{3}t, y = \frac{1}{2} + \frac{3}{8}t, z = \frac{3}{2} - \frac{4}{3}t$

D $x = -\frac{7}{3} + 3t, y = -\frac{3}{8} - \frac{1}{2}t, z = \frac{4}{3} - \frac{3}{2}t$

Q11: Give the parametric equation of the line on point $(2, -4, 4)$, with direction vector $(1, -1, 5)$.

A $x = 4 + 5t, y = -4 - t, z = 2 + t$

B $x = 2 + t, y = -4 - t, z = 4 + 5t$

C $x = 1 + 2t, y = -1 - 4t, z = 5 + 4t$

D $x = 3t, y = -5t, z = 9t$

Q12: Determine the parametric equations of the straight line passing through the points $(3, 3, 4)$ and $(5, 2, -4)$.

A $x = 5 + 2t, y = 2 - t, z = -4 - 8t$

B $x = 3 + 5t, y = 3 + 2t, z = 4 - 4t$

C $x = 5 + 8t, y = 2 + 5t, z = -4$

D $x = 5 + 3t, y = 2 + 3t, z = -4 + 4t$

Q13: Find the point of intersection of the lines $L_1: x = 7 + 3t_1, y = -4 - 3t_1, z = -7 - 5t_1$ and $L_2: x = 1 + 6t_2, y = 2 + t_2, z = 3 - 2t_2$.

A $(3, -3, -5)$

B $(6, 1, -2)$

C $(7, -4, -7)$

D $(1, 2, 3)$

E $(7, 3, 7)$

Q14: Find the point of intersection of the lines $\frac{x-6}{4} = y+3 = z$ and $\frac{x-11}{3} = \frac{y-14}{-6} = \frac{z+9}{2}$.

A $\left(\frac{83}{4}, -\frac{11}{2}, -\frac{5}{2}\right)$

B $\left(-4, -\frac{11}{2}, -\frac{5}{2}\right)$

C no intersection point

D $(6, 3, 0)$

E $(11, 14, -9)$

Q15: Which of the following points lies on the straight line $\mathbf{r} = \langle 3, 2, 1 \rangle + t\langle 2, -1, -5 \rangle$?

A $(-3, 5, 16)$

B $(1, -3, 0)$

C $(-1, -2, 4)$

D $(2, 0, 3)$