

- Solving lines in space is similar to solving linear equations in 3 variables, namely x , y , z . For solving 3 unknowns, we need at least 3 equations, 2 of the equations would be the 2 lines given in the question and the 3rd equation will be formed using the constraints given in the question.
- If the equations of the lines is given in symmetric form, we can easily solve it by supposing the 2 equations with 2 constants and solve them to obtain the point of intersection
- If the equations of the lines are given in vector form, then too we can find the point of intersection by solving the 3 equations of x , y and z from the 2 lines.
- The shortest distance between a point and line will be the perpendicular distance and can be found in the same way as in 2D geometry
- The shortest distance between 2 lines cannot necessarily be the perpendicular distance between them unless they are parallel. To find the distance, we take an arbitrary point on one line using a variable which satisfies its equation and find the distance of the point from the line. The shortest distance comes out in the form of a variable, so we find the value of the variable for the minimum distance using differentiation.