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If the line with the vector parameterization  intersects with given sphere then point  will satisfy the equation of sphere.

Given that:

**Equation of sphere:**  

**Equation of line with vector parameterization:**



As  satisfy the equation of sphere.



The above equation can be further solved to



Using quadratic formula, we can find roots of above equation

 .



So, Points of intersection of given line and sphere are .

That is, 



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Further, 



