Answer on Question #70299 – Math – Analytic Geometry

Question

What are projections of helix (acost, asint, t) in all three coordinate planes xy-plane, yz-plane, xz-plane?

Solution

1) projection of helix (acost, asint, t) in xy-plane is (acost, asint). The curve is x= acost , y= asint. If we take x^2+y^2, then we get $x^2+y^2 = (acost)^2+ (asint)^2=a^2((cost)^2+ (sint)^2)=a^2$. This is a circle of radius a: $x^2+y^2=a^2$.

2) projection of helix (acost, asint, t) in xz-plane is (acost, t). The curve is x= acost , z= t. So,

x= acosz. This is a cosine function: x= acosz

3) projection of helix (acost, asint, t) in yz-plane is (asint, t). The curve is y= asint , z= t. So,

y= asinz. This is a sine function: y= asinz.

Answer: $x^2+y^2=a^2$, x= acosz, y= asinz.