Answer on Question #70271 – Math – Analytic Geometry

Question

1. The direction of a vector $V(X_V, Y_V, Z_V)$ intersects a sphere on point "B". Assuming $O(0,0,0)$ as the center and 'r' as the radius of the sphere. The mirror of the vector based on OB direction passes the point $C(0,0,h)$. The "B" coordinate, $B(X_B, Y_B, Z_B)$, is required based on the above parameters.

Solution

Vector V is collinear to the vector OB by the definition of a vector. The mirror image of a vector is considered in relation to the same direction. Since the mirror contains a point $C(0,0,h)$, the collinear direction of OB is OC, then the vector V and its mirror belong to the Z-axis.

Therefore, the point of sphere B belongs to the Z-axis, and its coordinates are (0,0, r) or (0,0, -r).

Answer: $B(0,0,-r)$ or $B(0,0,r)$.