1.2.11 Convert the vector $\mathbf{B} = 3\mathbf{u_r} + 4\mathbf{u}_\theta + 5\mathbf{u}_\phi$ that is in spherical coordinates into Cartesian coordinates. Check your answer using MATLAB.

$$x = r\sin\theta\cos\phi$$
$$= 3\sin 4\cos 5$$
$$\approx -0.644$$

$$y = r\sin\theta\sin\phi$$
$$= 3\sin 4\sin 5$$
$$\approx 2.18$$

$$z = r\cos\theta$$
$$= 3\cos 4$$
$$\approx -1.96$$

The final vector in spherical coordinates is $\mathbf{B} \approx -0.644\mathbf{u_x} + 2.18\mathbf{u_y} - 1.96\mathbf{u_z}$.