

Special Problem 2-4.8

Evaluate the scalar field:

$$T(r, \theta, \phi) = \frac{r^2 \cos \phi \sin \theta}{\cos^2 \theta \sin^2 \phi}$$

at point $P(x=3, y=4, z=5)$ in each of two ways:

- a) Transform the **location of point P** from Cartesian to spherical coordinates, and **then** directly evaluate the scalar field above.
- b) Transform the **scalar field** from spherical to Cartesian coordinates, and **then** directly evaluate using the Cartesian coordinates of the point P shown above.
- c) Compare your two answers. Does this surprise you?