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 ?