SPHERICAL POLAR COORDINATES.

$$g(x,y,z) = z+y-xy \quad \text{or} \quad z+y(1-x)$$

We know:

$$x = r\sin\theta\cos\phi,$$
$$y = r\sin\theta\sin\phi$$
$$z = r\cos\theta$$

So $g(r,\theta,\phi) = r\cos\theta + r\sin\theta\sin\phi(1 - r\sin\theta\cos\phi)$

$$= r\cos\theta + r\sin\theta\sin\phi - r^2\sin\phi\cos\phi + r^2\sin\phi\cos\phi$$

$$\ldots \cos^2\theta$$

SINCE I AM TRYING TO FIND AN EXPRESSION FOR g IN SPHERICAL POLAR COORDINATES, IS THE ANSWER CORRECT?

ALSO, CAN IT BE CANCELLED DOWN / SIMPLIFIED ANY FURTHER? IE. SHOULD I FACTORISE USING r?

OR LEAVE THE ANSWER AS IT IS?

THANK YOU