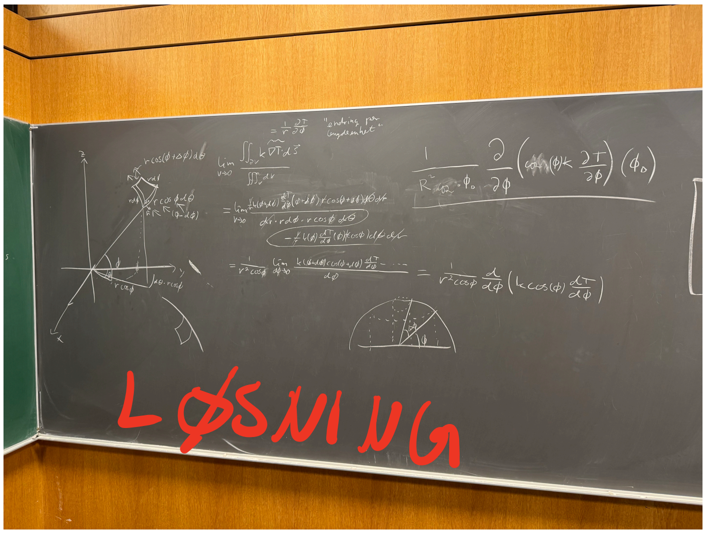
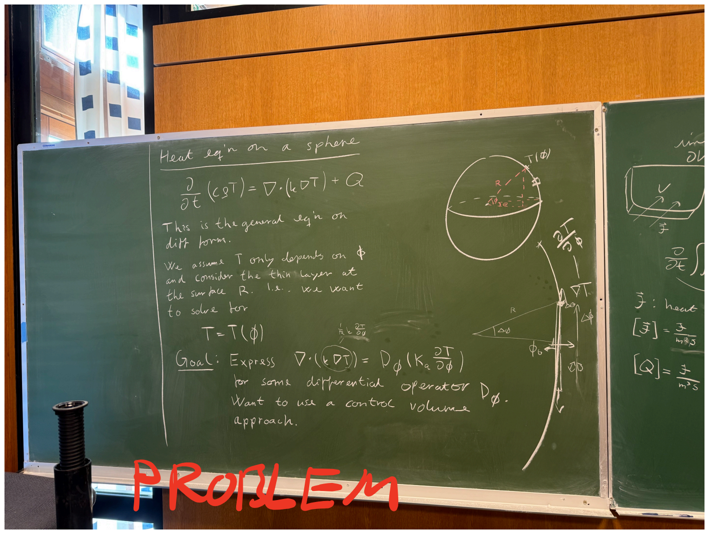
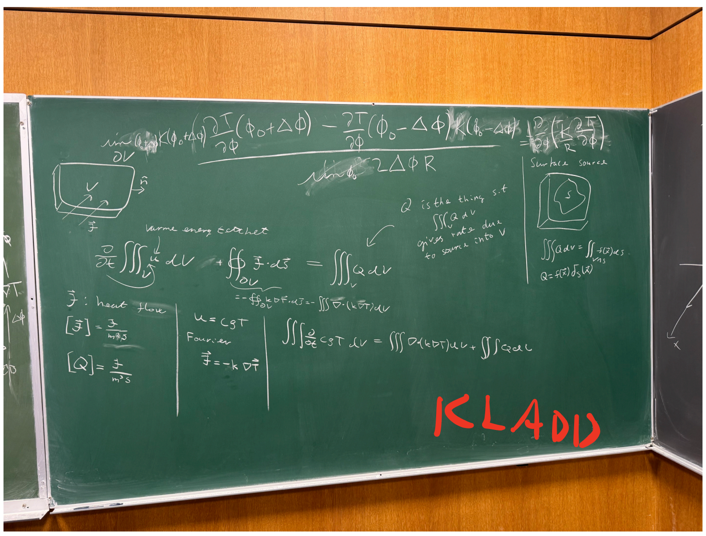
$$D_\phi\left(K_a \frac{\partial T}{\partial \phi}\right) \mapsto D \frac{\partial}{\partial x}\left(\overbrace{(1-x^2)}^{=\cos^2\phi}\frac{\partial T}{\partial x}\right)$$

We have $x=\sin\phi$, so $\frac{\partial T}{\partial x} = \frac{\partial T}{\partial \phi}\frac{d\phi}{dx} = \frac{1}{\cos\phi}\frac{\partial T}{\partial \phi}$

$\frac{dx}{d\phi} = \cos\phi$

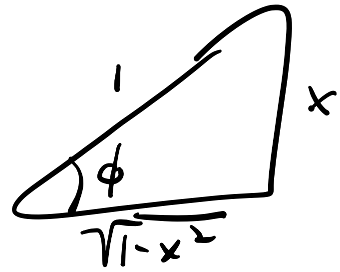






$$\frac{1}{r^2\cos\phi}\frac{d}{d\phi}\left(k\cos(\phi)\frac{dT}{d\phi}\right)$$

$$\frac{1}{r^2\cos\phi}\frac{d}{d\phi}\left(k\cos\phi\frac{dT}{d\phi}\right)$$



Bytte $\sin\phi = x.$ $\frac{dx}{d\phi} = \cos\phi$

$$\frac{d}{d\phi} = \frac{dx}{d\phi}\frac{d}{dx} = \cos\phi\frac{d}{dx}$$

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$$\frac{1}{r^2}\frac{d}{dx}\left(k\cos^2\phi\frac{dT}{dx}\right)$$

$$= \frac{1}{r^2}\frac{d}{dx}\left(k\left(1-x^2\right)\frac{dT}{dx}\right)$$