Week 6

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Task 1

How many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields?

$Q_{12,noshield} = \frac{A\sigma(T_1^4 - T_2^4)}{\frac{1}{\varepsilon 1} + \frac{1}{\varepsilon 2} - 1}$

$Q_{12,N\ shield} = \frac{A\sigma(T_1^4 - T_2^4)}{(N+1)(\frac{1}{\varepsilon 1} + \frac{1}{\varepsilon 2} - 1)} = \frac{1}{N+1} Q_{12,noshield}$

So if want heat transfer rate to be 1% of the case without shields

Then we have $\frac{1}{N+1} = 1\%$

So N=99

We should add 99 shields