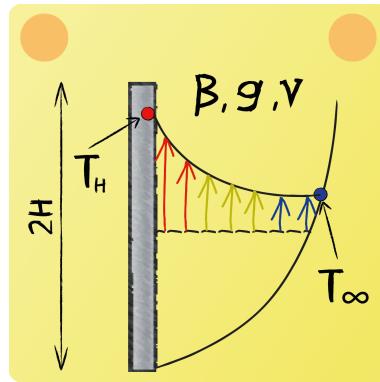


## Lecture 3 Question 4

Give an expression for the Grashof number  $\text{Gr}_L$  for the given situation in the figure, in terms of known parameters.



The general expression for the Grashof number is  $\text{Gr}_L = \frac{\beta g \rho^2 (T_w - T_\infty) L^3}{\eta^2}$ , where the characteristic length for the given case is  $L = 2H$ , the wall temperature  $T_w = T_H = 4T_\infty$  and  $\nu = \frac{\eta}{\rho}$ .

Thus:

$$\text{Gr}_L = \frac{24\beta g T_\infty H^3}{\nu^2}$$