

Dim. anal.

LMT

0 What is to be determined?

1 Find governing parameters

2 Dim. of gov. par.

$$[\sigma] = \frac{ML}{T^2} \quad [\mu] = 1$$

$$[t] = T$$

$$[\eta_g] = \frac{ML}{T}$$

$$\varphi - \varphi_0$$
$$\sigma, t, \eta_g, \mu$$

3 Find # indep, ^{dimensional,} gov. par.

\Rightarrow only 2 indep

$$[\eta_g] = [\sigma t]$$

4 Π theorem # dimensionless products

$$= \# \text{ governing param} - \# \text{ gov. par. with indep dim.}$$
$$4 - 2$$

$$\Rightarrow \varphi - \varphi_0 = \Pi \left(\frac{\sigma t}{\eta_g}, \mu \right)$$