

Mtg 33: Mon, 21 Mar 11

33-1

- comments on HW4.8

- Stigler's law of misnomy:

"Gaussian" distr \rightarrow de Moivre
(normal)

Pythagoras' thm

NPR 2011.03.09

- Algorithm: al-Kharizmi

- Calculix tutorial by Ty Beede, mechanical hacks blog

HW6.3: Reproduce all steps in tutorial by Beede.

2D & 3D cont'd: p. 32-4

$$dw = dx_1 dx_2 dx_3 = dx dy dz$$

$$\text{div } \underline{q} = \frac{\partial q_i}{\partial x_i} \quad \text{sum on repeated index } i$$
$$= \frac{\partial q_1}{\partial x_1} + \frac{\partial q_2}{\partial x_2} + \frac{\partial q_3}{\partial x_3}$$

$$= \frac{\partial \varphi}{\partial x} + \frac{\partial \varphi}{\partial y} + \frac{\partial \varphi}{\partial z} \quad (1) \quad \text{[33-2]}$$

$$\underline{q} = \varphi_i \underline{e}_i, \quad \{\underline{e}_i\} \text{ basis vectors} \quad (2)$$

Sum on i

Fourier's law:

$$\underline{q} = -\underline{\kappa} \cdot \text{gradu} \quad (3)$$

Isotropic material $\Rightarrow \underline{\kappa} = \kappa \underline{\underline{I}}$

Identity matrix

$$\underline{q} = -\kappa \text{gradu}$$

(7) p. 32-4:

$$+ \underbrace{\text{div}(\underline{\kappa} \cdot \text{gradu})}_{} + f = \rho c \frac{\partial u}{\partial t}$$

$$\frac{\partial}{\partial x_i} \left(\kappa_{ij} \frac{\partial u}{\partial x_j} \right) \quad \text{sum on } i, j$$

(4)