

Dæmi 1, (1-01-52)

a)  $\bar{F} = m\bar{a}$ , funna  $[F] = [ma] = \frac{ML}{T^2}$

b)  $K = \frac{1}{2}m\nu^2$ ,  $[K] = \frac{ML^2}{T^2}$  líka almennt fyrir orku

c)  $p = m\nu$ ,  $[p] = \frac{ML}{T}$  skriðþungi

d)  $W = mas$ ,  $[W] = \frac{ML}{T^2}L = \frac{ML^2}{T^2}$  vinna með sömu vídd og orka

e)  $L = mvr$ ,  $[L] = \frac{ML}{T}L = \frac{ML^2}{T}$  hverfiþungi

① auka)

$E = hf$ , vitum að  $[f] = \frac{1}{T}$

og  $[E] = \frac{ML^2}{T^2}$

$\rightarrow [h] = \left[\frac{E}{f}\right] = \frac{ML^2}{T^2} \cdot T = \frac{ML^2}{T}$

Þannig að víddin á Plancks-fastanum er sama og vídd hverfiþunga

②

Dæmi 2, (1-01-54)

$[V] = L^3$ ,  $[g] = \frac{M}{L^3}$ ,  $[t] = T$

a)  $\left[\int g dV\right] = [gV] = M$

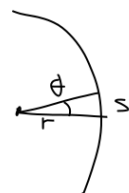
$\left[\frac{dV}{dt}\right] = \left[\frac{V}{t}\right] = \frac{L^3}{T}$

③

$\left[g \frac{dV}{dt}\right] = \left[\frac{gV}{t}\right] = \frac{M}{L^3} L^3 \frac{1}{T} = \frac{M}{T}$

Dæmi 3, (1-01-55)

$s = r\theta$



$[r] = L$

$[s] = L$

$\rightarrow [\theta] = 1$

Horn er mælt í viddarláusum "einingum"

④

Dæmi 4, (1-02-68 (a) og (b))

$$a) \bar{A} = 2,0\hat{i} - 4,0\hat{j} + \hat{k} = (2, -4, 1)$$

$$\bar{C} = 3,0\hat{i} + 4,0\hat{j} + 10,0\hat{k} = (3, 4, 10)$$

$$\text{fuma } \bar{A} \times \bar{C} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & -4 & 1 \\ 3 & 4 & 10 \end{vmatrix}$$

$$= (-4 \cdot 10 - 4 \cdot 1, -2 \cdot 10 + 3 \cdot 1, 2 \cdot 4 - 3 \cdot (-4))$$

$$= \underline{(-44, -17, 20)} = \underline{\bar{D}}$$

⑤

skoðum

$$\bar{D} \cdot \bar{A} = (-44, -17, 20) \cdot (2, -4, 1) = 0$$

$$\bar{D} \cdot \bar{C} = (-44, -17, 20) \cdot (3, 4, 10) = 0$$

bannig að vigurinn  $\bar{D}$  er hornréttur á vigrana  $\bar{A}$  og  $\bar{B}$ , eins og verður að vera

$$b) \bar{A} = (3, 4, 10), \bar{A} \times \bar{C} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 3 & 4 & 10 \\ 2 & -4 & 1 \end{vmatrix}$$

$$\text{því, } \bar{A} \times \bar{C} = -\bar{C} \times \bar{A}$$

$$= \underline{(44, 17, -20)}$$

⑥