

m

$$F = M \cdot a$$

kg

$$N = \text{kg} \cdot \text{m} \cdot \text{s}^{-2}$$

s

A

$$W = \underset{\uparrow}{J} \cdot \text{s}^{-1} = \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3}$$

K

$$N \cdot m$$

mol

$$V = A^{-1} \cdot \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3}$$

cd

$$5.2 \cdot 10^9 \text{ s} = 5.2 \text{ Gs}$$

$$\text{da} \cdot 10$$

$$\text{d} \cdot 10^{-1}$$

$$\text{h} \cdot 100$$

$$\text{c} \cdot 10^{-2}$$

$$\text{k} \cdot 10^3$$

$$\text{m} \cdot 10^{-3}$$

$$\text{M} \cdot 10^6$$

$$\mu \cdot 10^{-6}$$

$$\text{G} \cdot 10^9$$

$$\text{n} \cdot 10^{-9}$$

$$\text{T} \cdot 10^{12}$$

$$\text{P} \cdot 10^{-12}$$

$$\text{P} \cdot 10^{15}$$

$$\text{f} \cdot 10^{-15}$$

$$\text{E} \cdot 10^{18}$$

$$\text{a} \cdot 10^{-18}$$

$$2.3 \cdot 10^2 \text{ kN} \cdot \text{m}^{-2} \rightarrow 23 \text{ N} \cdot \text{cm}^{-2}$$

$$2.3 \cdot 10^2 \text{ kN} \cdot \text{m}^{-2} = \times \text{ N} \cdot \text{cm}^{-2}$$

$$2.3 \cdot 10^2 \cdot 10^3 \text{ N} \cdot \text{m}^{-2} = \times \text{ N} (10^{-2} \text{ m})^{-2}$$

$$2.3 \cdot 10^5 \cancel{\text{ N} \cdot \text{m}^{-2}} = \times \cancel{\text{ N}} 10^4 \cancel{\text{ m}^{-2}}$$

$$2.3 \cdot 10^5 = \times \cdot 10^4 \Rightarrow \times = 23$$

$$72 \text{ km h}^{-1} \text{ s}^{-1} = \times \overset{20}{\text{ m s}^{-2}}$$

$$72 \cdot 10^3 \text{ m} (60 \cdot 60 \cdot \text{s})^{-1} \text{ s}^{-1} = \times \text{ m} \cdot \text{s}^{-2}$$

$$72 \cdot 10^3 \cancel{\text{ m}} \frac{1}{60 \cdot 60} \cdot \cancel{\text{s}^{-1} \cdot \text{s}^{-1}} = \times \cancel{\text{ m}} \cdot \cancel{\text{s}^{-2}}$$

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$$\frac{72000}{3600} = 20$$

## Operazioni su grandezze fisiche

- + e - solo fra grandezze omologhe

$$10 \text{ m} + 70 \text{ cm} = 10 \underline{\text{m}} + 0.7 \underline{\text{m}} = 10.7 \text{ m}$$

- \* e / sempre validi

$$\left( 10 \frac{\text{m}}{\text{s}} \right) \cdot \left( 7 \text{ kg} \cdot \text{s} \right) = 70 \text{ kg} \cdot \text{m}$$

- $x^y$   $e^x$   $\sin(x)$   $\cos(x)$  ...

solo fra numeri puri.

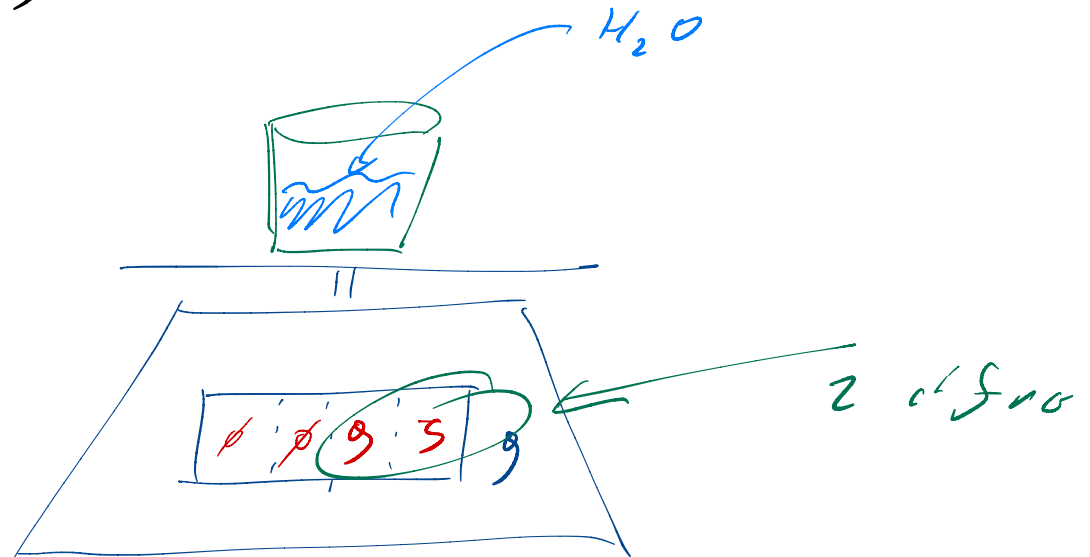
$$1 \text{ in} = 2.54 \text{ cm}$$

$$\underline{\text{es}} \quad \frac{2 \text{ in}}{5 \text{ mm}} = \frac{50.8 \cancel{\text{ mm}}}{5 \cancel{\text{ mm}}} = 10.16$$

$$\dots = 7 \text{ cm}^2$$

$$\cancel{X = 7 + 2 = 9 \text{ cm}^2}$$

# Cifre significative



$$\text{peso molecolare } H_2O = 18.0153 \text{ g/mol}$$

$$\text{moli } H_2O = \frac{93 \text{ g}}{18.0153 \text{ g/mol}} = 5.1451428192 \dots \text{ mol}$$

$$92.5 \text{ g} \leq \text{peso } H_2O \leq 93.5 \text{ g}$$

$$(5.1)345 \text{ mol} \leq \text{moli } H_2O \leq (5.19)00 \text{ mol}$$

2 cifre

In notazione scientifica

tutte le cifre della mantissa sono  
significative

$$0.0089421$$

↓ con 3 c.s. di precisione

$$8.94 \cdot 10^{-3}$$

In notazione decimale

senza virgola  
↓

• gli zeri a destra di un intero  
*non* sono significativi

• gli zeri a sinistra di uno 0...  
*non* sono significativi

$$7.2 \text{ km} = \underline{7200} \text{ m} \quad 2 \text{ c.s.}$$

$$\underline{7200.0} \text{ m} \quad 5 \text{ c.s.}$$

$$92 \text{ g} = \underline{0.092} \text{ kg} \quad 2 \text{ c.s.}$$

$$0.0920 \text{ kg} \quad 3 \text{ c.s.}$$

$$\begin{array}{r}
 \begin{array}{c} \uparrow n \\ 18.0 \end{array} \bigg| \begin{array}{c} \circledast 6 \\ 2 \end{array} \\
 \hline
 \downarrow 3 \leq 5 \\
 18.1
 \end{array}
 \quad
 \begin{array}{ll}
 0 \dots 4 & n \rightarrow n \\
 5 \dots 9 & n \rightarrow n+1
 \end{array}$$

$$0.739 \bigg| \begin{array}{c} \circledast 6 \\ 1 \end{array}$$

$$0.800 = 8.00 \cdot 10^{-1}$$

Risolvi:

$$2.2 \cdot 10^{-3} x^2 + 1.5 \cdot 10^2 x - 4.5 = 0$$

$$x = \frac{-1.5 \cdot 10^2 + \sqrt{2.25 \cdot 10^4 + 39.6 \cdot 10^{-3}}}{4.4 \cdot 10^{-3}}$$

$$x = \frac{-150 + \sqrt{22500.0396}}{0.0044} =$$

$$= \frac{0}{0.0044} = 0 \neq 0.030$$

risultato giusto