

University/College/School Name
 Institute Name
 Departament Name
 Prof. Name

Exam/Test 1 – Physics 101 – 01 Jan 2023

Any important message to students, if necessary

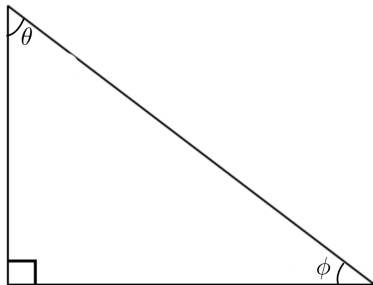
1. A particle of mass 7.9 kg is subject to an external force of 17.4 N. Calculate the acceleration in m/s^2 in a one-dimensional movement.

- (a) 2.2 (b) 7.4
 (c) 11.8 (d) 4.2
 (e) 8.5

2. Mark the true alternative.

- (a) If \vec{A} and \vec{B} are vectors, then $\vec{A} \times \vec{B}$ is a vector perpendicular to both \vec{A} and \vec{B} .
 (b) A vector multiplied by a scalar results is a vector with different direction.
 (c) The result of summing a vector and a scalar is a scalar.
 (d) Division between vectors is defined in Mathematics.
 (e) Vectors can not be multiplied by scalars.

3. Consider the rectangle triangle of the figure below and knowing $\theta = 27^\circ$, determine ϕ **in rad**.



- (a) 1.237 (b) 1.328 (c) 1.176 (d) 1.100 (e) 1.063

Fórmulas e Constantes

$$I = \frac{P_s}{4\pi r^2}; \quad E = hf; \quad p = \frac{hf}{c} = \frac{h}{\lambda}$$

$$hf = K_{\max} + \Phi; \quad \Delta\lambda = \frac{h}{mc}(1 - \cos\phi)$$

$$\frac{d^2\psi}{dx^2} + \frac{8\pi^2m}{h^2}[E - U(x)]\psi = 0$$

$$T \approx e^{-2bL}, \text{ onde } b = \sqrt{\frac{8\pi^2m(U_b - E)}{h^2}}$$

$$E_n = \left(\frac{h^2}{8mL^2} \right) n^2, \text{ para } n = 1, 2, 3 \dots$$

$$\psi_n(x) = A \sin\left(\frac{n\pi}{L}x\right), \text{ para } n = 1, 2, 3 \dots$$

$$\Delta x \Delta p = h/2\pi$$

$$\epsilon_0 = 8,854 \times 10^{12} \text{ F/m}; \quad \mu_0 = 1,257 \times 10^{-6} \text{ H/m}$$

$$c = 3,0 \times 10^8 \text{ m/s}; \quad h = 6,63 \times 10^{-34} \text{ J/s} = 4,14 \times 10^{-15} \text{ eV.s}$$

$$hc = 1240 \text{ eV.nm}$$

$$\text{Eletron: } mc^2 = 511 \text{ keV}$$

Example

For the ID number 2013579, mark as follows:

STUDENT ID										
—	0	1	2	3	4	5	6	7	8	9
1°										
2°										
3°										
4°										
5°										
6°										
7°										

RESERVED										
un	–		–	–	–	–	–	–	–	–
ANSWERS										
–	1	2	3	–	–	–	–	–	–	–
a				–	–	–	–	–	–	–
b				–	–	–	–	–	–	–
c				–	–	–	–	–	–	–
d				–	–	–	–	–	–	–
e				–	–	–	–	–	–	–
STUDENT ID										
–	0	1	2	3	4	5	6	7	8	9
1°										
2°										
3°										
4°										
5°										
6°										
7°										

NAME:

ID NUMBER: