Universidade Federal de Ouro Preto
Instituto de Ciências Exatas e Biológicas
Departamento de Física
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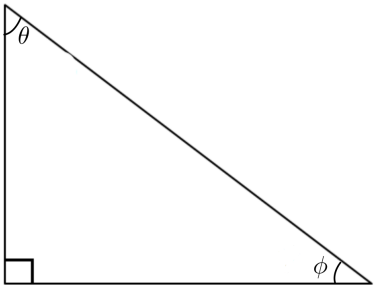
Prova 2 – FIS110-73 – 17/06/2022

1. Mark the true alternative.
(a) The vectorial product between collinear vectors is zero.
(b) Vectors can not be multiplied by scalars.
(c) Division between vectors is defined in Mathematics.
(d) The result of summing a vector and a scalar is a scalar.
(e) The result of a scalar product between vectors is a vector itself.

2. A particle of mass 2,7 kg is subject to an external force of 18,9 N. Calculate the acceleration in m/s^2 in a one-dimensional movement.
(a)17,0 (b)9,4
(c)3,1 (d)13,0
(e)7,0

3. Consider the rectangle triangle of the figure below and knowing $\theta = 26°$, determine ϕ **in rad**.



(a)1,174 (b)1,059 (c)1,252 (d)1,117 (e)1,305

Fórmulas e Constantes

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

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

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

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

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

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

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

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

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

$hc = 1240$ eV.nm

Eletron : $mc^2 = 511$ keV

Por exemplo, se seu número de matrícula for 12.1.3579, temos que

12.1.3579

1º 2º 3º 4º 5º 6º 7º

e a tabela deve ser preenchida assim:

xx	0	1	2	3	4	5	6	7	8	9
1°		■								
2°			■							
3°		■								
4°				■						
5°						■				
6°								■		
7°										■

NÃO MARCAR										
un	–	■	–	–	–	–	–	–	–	–
GABARITO										
–	1	2	3	–	–	–	–	–	–	–
a				–	–	–	–	–	–	–
b				–	–	–	–	–	–	–
c				–	–	–	–	–	–	–
d				–	–	–	–	–	–	–
e				–	–	–	–	–	–	–
MATRÍCULA										
–	0	1	2	3	4	5	6	7	8	9
1°										
2°										
3°										
4°										
5°										
6°										
7°										

MATRÍCULA:

NOME:

TURMA: