# AP Physics 1 Summer Assignment - Math Review

**1. Scientific Notation:**

The following are ordinary physics problems. Write the answer in scientific notation and simplify the units ($\pi=3$).

a. $T_s = 2\pi\sqrt{\dfrac{4.5\times10^{-2}\,kg}{2.0\times10^{3}\,kg/s^2}} =$                                   $s=$_____

b. $F = \left(9.0\times10^{9}\,\dfrac{N\cdot m^2}{C^2}\right)\dfrac{\left(3.2\times10^{-9}\,C\right)\left(9.6\times10^{-9}\,C\right)}{\left(0.32m\right)^2}$          $F=$_____

c. $\dfrac{1}{R_p} = \dfrac{1}{4.5\times10^{2}\,\Omega} + \dfrac{1}{9.4\times10^{2}\,\Omega}$                       $R_p=$_____

d. $K_{max} = \left(6.63\times10^{-34}\,J\cdot s\right)\left(7.09\times10^{14}\,s\right) - 2.17\times10^{-19}\,J$     $K_{max}=$_____

e. $\gamma = \dfrac{1}{\sqrt{1 - \dfrac{2.25\times10^{8}\,m/s}{3.00\times10^{8}\,m/s}}}$                            $\gamma=$_____

f. $K = \dfrac{1}{2}\left(6.6\times10^{2}\,kg\right)\left(2.11\times10^{4}\,m/s\right)^2 =$              $K=$_____

g. $\left(1.33\right)\sin 25.0° = \left(1.50\right)\sin\theta$                               $\theta=$_____

## 2. Solving Equations:

Often problems on the AP exam are done with variables only. Solve for the variable indicated. Don't let the different letters confuse you. Manipulate them algebraically as though they were numbers.

a. $K = \frac{1}{2}kx^2$ $\qquad , x = $ _____

b. $T_p = 2\pi\sqrt{\frac{\ell}{g}}$ $\qquad , g = $ _____

c. $F_g = G\frac{m_1 m_2}{r^2}$ $\qquad , r = $ _____

d. $mgh = \frac{1}{2}mv^2$ $\qquad , v = $ _____

e. $x = x_o + v_o t + \frac{1}{2}at^2$ $\qquad , t = $ _____

f. $B = \frac{\mu_o}{2\pi}\frac{I}{r}$ $\qquad , r = $ _____

g. $x_m = \frac{m\lambda L}{d}$ $\qquad , d = $ _____

h. $pV = nRT$ $\qquad , T = $ _____

i. $\sin\theta_c = \frac{n_1}{n_2}$ $\qquad , \theta_c = $ _____

j. $qV = \frac{1}{2}mv^2$ $\qquad , v = $ _____

### 3. Trigonometry

Using the generic triangle to the right, Right Triangle Trigonometry and Pythagorean Theorem solve the following. ***Your calculator must be in degree mode.***
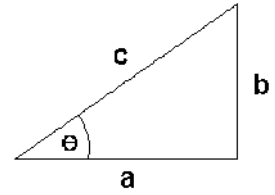


g.  $\theta = 55^\circ$ and $c = 32$ $m$, solve for $a$ and $b$.

   _____

h.  $\theta = 45^\circ$ and $a = 15$ $m/s$, solve for $b$ and $c$.

   _____

i.  $b = 17.8$ $m$ and $\theta = 65^\circ$, solve for $a$ and $c$.

   _____

j.  $a = 250$ $m$ and $b = 180$ $m$, solve for $\theta$ and $c$.

   _____

k.  $a = 25$ $cm$ and $c = 32$ $cm$, solve for $b$ and $\theta$.

   _____

l.  $b = 104$ $cm$ and $c = 65$ $cm$, solve for $a$ and $\theta$.

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