

**Algebraic Manipulations Practice for Science Classes**

Perform the following algebra tasks. Show all of the steps necessary to solve for the given variable.

1.  $Q = mc\Delta T$       solve for  $m$

2.  $d = m/V$       solve for  $V$

3.  $P_1V_1 = P_2V_2$       solve for  $V_2$

4.  $E = h\nu$       solve for  $\nu$

5.  $P_1V_1T_2 = P_2V_2T_1$       solve for  $P_2$

6.  $\lambda = h/mv$       solve for  $v$

7.  $E = mc^2$       solve for  $c$

8.  $T_F = 1.80(T_C) + 32$  solve for  $T_C$

9.  $PV = nRT$       solve for  $R$

10.  $\frac{P_1 V_1}{n_1 T_1} = \frac{P_2 V_2}{n_2 T_2}$       solve for  $T_2$



6. What is the mass ( $m$ ) of a particle with a wavelength of  $4.257 \times 10^{-7} \text{ cm}$  ( $\lambda$ ), and a frequency of  $7.05 \times 10^{14} \text{ Hz}$  ( $\nu$ )?
7. Calculate the energy ( $E$ ) of a nuclear particle with a mass of  $1.673 \times 10^{-24} \text{ g}$  ( $m$ ),  
( $c = 2.998 \times 10^8 \text{ m/s}$ )
8. Convert  $47^\circ\text{F}$  to Celsius.
9. What is the pressure in atmospheres ( $P$ ) exerted by a  $0.500 \text{ mol}$  ( $n$ ) sample of chlorine in a  $10.0 \text{ L}$  ( $V$ ) container at  $298 \text{ K}$  ( $T$ )?
10. What is the initial temperature ( $T_1$ ) of a  $1.50 \text{ mol}$  ( $n$ ) sample of gas at  $760 \text{ mm Hg}$  ( $P_1$ ) and a volume of  $2.65 \text{ L}$  ( $V_1$ ) that is heated to  $305 \text{ K}$  ( $T_2$ ) at a pressure of  $675 \text{ mm Hg}$  ( $P_2$ ) and a new volume of  $5.00 \text{ L}$  ( $V_2$ )?