

# PHY 122/124 EXPERIMENT 9: Atomic spectra – Worksheet

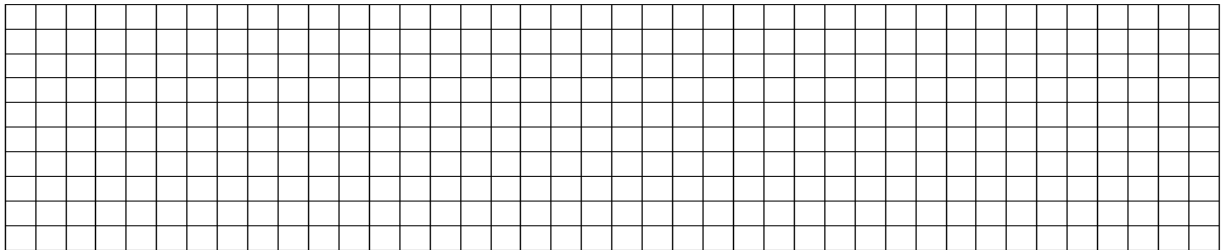
## Part I: Qualitative Study of the Diffraction Grating:

The approximate position of the gas tube is \_\_\_\_\_

The approximate positions of the spectral lines on the ruler are:

Order $m$	position of purple line [ ]	position of blue-green line [ ]	position of red line [ ]
1			
2			

Make a sketch of the spectral lines as a function of distance along the ruler, with colors and order of the interference maxima labeled: (no need to be very accurate here)



Explain the observed sequence using Eq. (9.1):

**Part II: Quantitative Study of the Hydrogen Spectral Lines:**

The distance  $y$  (see Fig. 2) with uncertainty and unit is: \_\_\_\_\_ +/- \_\_\_\_\_ [     ]

Your readings of the spectral line positions on the ruler with estimated uncertainties are:

Order $m$	Color	Pos. right [   ]		Uncert. [   ]
1	Red			
1	Blue-green			
1	Purple			

	$x$ [   ]	$\Delta x$ [   ]	$x/2y$	Relative uncert in $x/2y$	$\theta$	$\lambda$ [   ]	$1/\lambda$ [   ]	$\Delta(1/\lambda)$ [   ]
Red( $n=3$ )								
Blue( $n=4$ )								
Purple( $n=5$ )								

Experimental value for  $R_H$  \_\_\_\_\_ +/- \_\_\_\_\_ [     ]