

PHY 122/124 EXPERIMENT 9: Atomic spectra – Worksheet

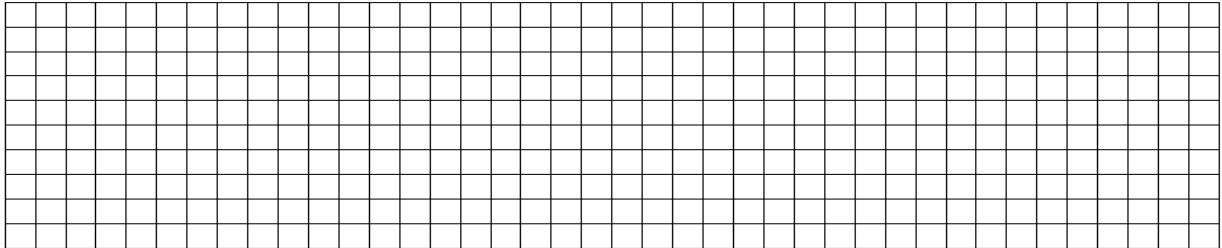
Part I: Qualitative Study of the Diffraction Grating:

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 equation (9.1):

Part II: Quantitative Study of the Hydrogen Spectral Lines:

The distance y (see Fig. 2) with error and unit is: _____ +/- _____ []

The readings of the spectral line positions on the ruler and their error estimates are:

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

	x []	Δx []	$x/2y$	Relative error in $x/2y$	θ	λ []	$1/\lambda$ []	$\Delta(1/\lambda)$ []
Red($n=3$)								
Blue($n=4$)								
Purple($n=5$)								

Experimental value for R_H _____ +/- _____ []