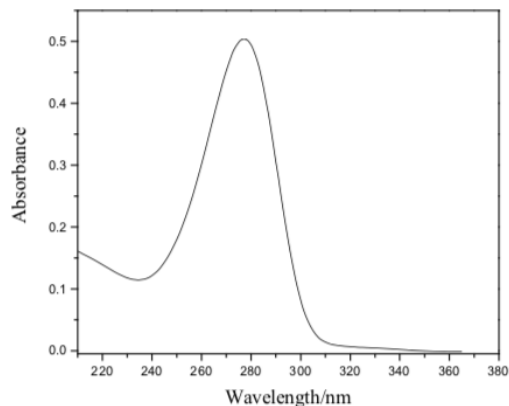Worksheet 3: Beer's Law

1. Using the plot above, which wavelength would you use to collect the absorbance of caffeine?

Concentration (M×10^{-5})	Absorbance
2.000	0.2286
4.000	0.4572
6.000	0.6858
8.000	0.9144

2. Use a program like Excel to plot the values in the table above to determine the molar extinction coefficient for caffeine.

3. There are approximately 95 mg of caffeine in a typical 8 oz cup of coffee. There are about 34 oz in 1 L. Calculate the concentration of caffeine in a cup of coffee.

4. Could you use your calibration curve to measure the concentration of caffeine in coffee? Why or why not? If not, what could you do to prepare a sample that could be used with your curve?

5. Use your calibration curve to calculate the concentration of caffeine in a sample if the absorbance was found to be 0.5372.

6. Calculate the concentration of caffeine in the original sample if the absorbance above was from a sample created by two serial 1 in 10 dilutions.

7. Calculate the percent difference between the value from the previous problem and the expected caffeine in a cup of coffee.