Graph paper assignment 2

1. Draw an ellipse with major axis 18 cm and minor axis 6 cm.
2. Measure the dimensions of the bar pendulum given to you in the lab and draw a 1: 4 scale down model of it on a graph paper. Measure the dimensions of the holes and also draw them in proper proportion.
3. Plot the following points on a graph paper and fit a linear curve to the data. Find a least square fit to the data and write the slope and intercept of the fitted line.

| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | 3.4 | 4.9 | 11.1 | 11.4 | 9.9 | 15.4 | 10.2 | 14.2 | 14.9 | 18.7 | 20.1 | 16.9 | 20.2 | 21.0 | 23.6 |

4. Plot the following data, and measure the time period and amplitude of the sine wave

| t | 0.0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | 0.0 | 0.8 | 1.4 | 1.8 | 2.0 | 1.8 | 1.4 | 0.8 | 0.0 | -0.8 | -1.4 | -1.8 | -2.0 | -1.8 | -1.4 | -0.8 | 0.0 | 0.8 | 1.4 | 1.8 | 2.0 |

| t | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 14.5 | 15.0 | 15.5 | 16.0 | 16.5 | 17.0 | 17.5 | 18.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | 1.8 | 1.4 | 0.8 | 0.0 | -0.8 | -1.4 | -1.8 | -2.0 | -1.8 | -1.4 | -0.8 | 0.0 | 0.8 | 1.4 | 1.8 | 2.0 |

5. Plot the following

| t | 0.0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | 0.0 | 3.6 | 6.4 | 8.0 | 8.2 | 7.2 | 5.2 | 2.7 | 0.0 | -2.4 | -4.3 | -5.3 | -5.5 | -4.8 | -3.5 | -1.8 | 0.0 | 1.6 | 2.9 | 3.6 |

| t | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 14.5 | 15.0 | 15.5 | 16.0 | 16.5 | 17.0 | 17.5 | 18.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | 3.7 | 3.2 | 2.4 | 1.2 | 0.0 | -1.1 | -1.9 | -2.4 | -2.5 | -2.2 | -1.6 | -0.8 | 0.0 | 0.7 | 1.3 | 1.6 | 1.7 |

6. Plot the intensity vs delta for the following data

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| x | -10.0 | -9.5 | -9.0 | -8.5 | -8.0 | -7.5 | -7.0 | -6.5 | -6.0 | -5.5 | -5.0 | -4.5 | -4.0 | -3.5 | -3.0 | -2.5 | -2.0 | -1.5 | -1.0 | -0.5 | 0.0 |
| I | 0.0 | -0.3 | -0.5 | -0.6 | -0.4 | 0.0 | 0.4 | 0.7 | 0.8 | 0.5 | 0.0 | -0.7 | -1.2 | -1.4 | -1.0 | 0.0 | 1.5 | 3.2 | 4.8 | 5.9 | 6.5 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| x | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9 | 9.5 | 10 |
| I | 5.9 | 4.8 | 3.2 | 1.5 | 0.0 | -1.0 | -1.4 | -1.2 | -0.7 | 0.0 | 0.5 | 0.8 | 0.7 | 0.4 | 0.0 | -0.4 | -0.6 | -0.5 | -0.3 | 0.0 |