**Data analysis:**

**Part 1:**

|  |  |  |
| --- | --- | --- |
| **m** | **∆y** | **mg** |
| **0.05** | **0.01** | **0.49** |
| **0.1** | **0.035** | **0.98** |
| **0.15** | **0.053** | **1.47** |
| **0.2** | **0.072** | **1.96** |
| **0.25** | **0.092** | **2.45** |
| **0.3** | **0.11** | **2.94** |

**The slope of the cure is K the spring’s constant = 24.8 0 ± 0.18**

**The y intercept is the indicative of how accurate this data is =0.1777**

**Part 2:**

|  |  |  |  |
| --- | --- | --- | --- |
| **m (kg)** | **t (s)** | **T** | **T^2**  |
| **0.15** | **5.001** | **0.5001** | **0.2501** |
| **0.2** | **5.01** | **0.501** | **0.251001** |
| **0.25** | **6.52** | **0.652** | **0.425104** |
| **0.3** | **6.95** | **0.695** | **0.483025** |
| **0.35** | **7.93** | **0.793** | **0.628849** |
| **0.4** | **8.52** | **0.852** | **0.725904** |

**Slope =4π2/k. so k= 4π2/slope =4\*(3.14)^2/2.0403= 19.32971 N.m**

**y- intercept =0.1004= 4π2 meff/k**

**so meff = y- intercept\*k/ 4π2 =0.049208 kg**

**T=t/10**

**results and discussions:**

**from the first part :**

**The slope of the cure is K the spring’s constant = 24.8 0 ± 0.18**

**From the second part :**

**K=19.32971 ± 2.1 N.m**

**The effective mass =0.049208 ± 0.035355kg**

**Discussion and conclusion :**

**The values obtained for the force constant are close to each other and within the range of the error**