**Young’s Modulus Practice Problems**

1. **A patient’s leg was put into traction, stretching the femur from a length of 0.46 m to 0.461 m. The femur has a diameter of 3.05 cm. With the knowledge that bone has a Young’s modulus of ~ 1.6 🞨 1010 in tension, what force was used to stretch the femur?**
2. **Using the following information on stress and strain, plot a graph in Excel to determine the Young’s modulus for an unknown material. The radius of the material is 4 cm.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Initial Length**  **(cm)** | **Final Length**  **(cm)** | **Change in Length – ΔL (cm)** | **Strain**  **(ΔL/L0)** | **Mass**  **(g)** | **Force**  **(N)** | **Stress**  **(N/cm2)** |
| **25** | **25.2** |  |  | **100** |  |  |
| **25** | **25.7** |  |  | **200** |  |  |
| **25** | **26.3** |  |  | **300** |  |  |
| **25** | **26.9** |  |  | **400** |  |  |