09-01-04 the diameter of an unknown ball bearing.

09-01-04 Section 30Amanda CollinsJohn ? This laboratory experiment looks at the mass and diameter of seven steelball bearings, using a vernier caliper to determine diameter, and anelectronic analytical balance to determine mass. Graphical data analysisthen allows us to observe the relationships between mass and diameter andto obtain a trendline in order to determine the diameter of an unknown ballbearing. Section IData Table 1: Mass and Diameter (D) of Ball Bearings| Mass (g) | Diameter (mm) | D^2 | D^3 | 1/D | 1/D ^2 | 1/D^3 | log(D) | 10^D | | 1| 1.

05 | 6. 3 | 39. 69 | 250. 047 | 0. 15873 | 0. 025195263 | 0.

003999 | 0. 799340549 | 1995262. 315 | | 2 | 2. 04 | 7.

8 | 60. 84 | 474. 552 | 0. 128205 | 0. 016436555 | 0. 002107 | 0. 892094603 | 63095734. 45 | | 3 | 3.

52 | 9. 4 | 88. 36 | 830. 584| 0.

106383 | 0. 011317338 | 0. 001204 | 0. 973127854 | 2511886432 | | 4 | 5. 6 | 11| 121 | 1331 | 0.

090909 | 0. 008264463 | 0. 000751 | 1. 041392685 | 1E+11 | | 5 | 6. 19| 11.

3 | 127. 69 | 1442. 897 | 0. 088496 | 0. 007831467 | 0. 000693 | 1. 053078443| 1.

99526E+11 | | 6 | 7. 96 | 12. 4 | 153. 76 | 1906. 624 | 0. 080645 | 0.

006503642| 0. 000524 | 1. 093421685 | 2. 51189E+12 | | 7 | 11. 9 | 14. 1 | 198.

81 | 2803. 221| 0. 070922 | 0. 005029928 | 0. 000357 | 1.

149219113 | 1. 25893E+14 | | Graph 1 with trendline: Graph 2 with trendline: picpicGraph 3 with trendline: Graph 4 with trendline: picpicGraph 5 with trendline: Graph 6 with trendline: picpicGraph 7 with trendline: Graph 8 with trendline: picpicSection IIUsing our straight line formula from Graph 2, y= 26. 133x – 18. 832, thepredicted value for the diameter of the unknown ball bearing is y = 32. 1mm. This value is inaccurate, possibly due to errors in measurement of theball bearings. 1. Density of each ball bearing: 1: 0.

17 g/mm32: 0. 26 g/mm33: 0. 37 g/mm34: 0.

51 g/mm35: 0. 548 g/mm36: 0. 642 g/mm37: 0. 844 g/mm32. The average density of the steep ball bearings is 0.

48 g/mm3. If theknown density of steel is 0. 785 g/mm3, the average obtained by ourmeasurements is inaccurate.

3. Three significant figures ought to be reported for the slope and yintercept in the trendline analysis, using the equation from Graph 2, dueto the value for x having three figures.