

# TUTORIAL SHEET 1

## Graphs, Tables and Location

1. Use Excel to recreate the bar charts and pie charts in section 1.4.1 of the lecture notes. The quality control data should have been saved as a Minitab worksheet qualcont.mtw.
2. Retrieve the camshaft.mtw worksheet and use Minitab to construct histograms for camshaft lengths from the plant and for each supplier separately. How would you describe the shapes of these distributions?
3. The following data are the 45 task times (in seconds) summarised in the frequency distribution on page 19 of the lecture notes. Construct the correct histogram as on page 20 using frequency densities. (Note: Minitab can deal with unequal class widths; Excel can't.) How would you describe the shape of this distribution?

29	16	28	39	21	45	28	24	31
37	35	32	24	27	35	35	19	21
42	17	49	29	82	17	97	46	80
22	48	43	73	38	49	23	27	44
58	27	34	26	19	36	38	24	33

4. For a simple scaffold structure made of steel, it is important to study the increase in length of tension members under load. For a load of 2,000 kilograms, nine similar tension members showed length increases as follows, with measurements in centimetres:  
 $2.5, 2.2, 3.0, 2.1, 2.7, 2.5, 2.8, 1.9, 2.2.$ 
  - (a) Find the mean and median of these measurements by hand.
  - (b) Suppose the measurements had been taken in metres rather than centimetres. Write down the mean and median of the corresponding measurements in metres.
5. Use Minitab to find the mean and median of task times given in question 3. Compare these two values. Which do you think is the better summary statistic for 'average'?

6. Using the data in the camshaft.mtw worksheet, complete the following table:

		Mean	Median
Camshaft	Plant		
lengths (mm)	Supplier 1		
	Supplier 2		

Comment on these values.

*NB. Get into the habit of saving your work in Minitab. If you just want to save the data, save as a worksheet. If you also want to save results of analyses and graphs, save as a project.*