

Instructions: Show all work. Use exact answers or appropriate rounding conventions. If you use your calculator, you can show work by saying which calculator commands you used.

1. A random sample of $n=30$ heat pumps of a certain type yielded the following observations on lifetime (in years).

2.0	1.3	6.0	5.1	0.4	1.0	5.3	1.9
15.7	0.7	0.9	4.8	12.2	5.3	0.6	4.3
2.7	11.1	5.4	3.4	8.6	9.1	0.9	1.8
5.3	7.8	6.1	4.0	3.9	9.4		

If we assume that the data is normally distributed, find the 99%, 95% and 90% confidence intervals.

$$1 \text{ VarStats} - S = 3.86 \quad \bar{X} = 4.87$$

Z Interval using above data

$$99\% \quad (3.0547, 6.6853)$$

$$95\% \quad (3.4887, 6.2513)$$

$$90\% \quad (3.7108, 6.0292)$$

2. Suppose that a batch of 1000 new batteries revealed a proportion of 5% (50 batteries) that were not meeting the minimum threshold the company set for charge. What is the 95% confidence interval for unsatisfactory batteries in the whole production run?

$$1\text{-PropZInt} \quad \begin{array}{l} x = 50 \\ n = 1000 \\ C\text{-level} = .95 \end{array}$$

$$(.03649, .06351)$$