Maths Revision Worksheet: Paper II Inferential Statistics

1. I know that the **Empirical Rule** shows us the very important relationship between normal distributions, the mean and standard deviations and that:

For any large population with mean \overline{x} and standard deviation σ

- (i) about 68% of the values will lie within one standard deviation of the mean, that is, between $\bar{x} \sigma$ and $\bar{x} + \sigma$
- (ii) about 95% of the values will lie within two standard deviations of the mean, that is, between $\bar{x} 2\sigma$ and $\bar{x} + 2\sigma$
- (iii) almost all (99.7%) of the values will lie within three standard deviations of the mean, that is, $\bar{x} 3\sigma$ and $\bar{x} + 3\sigma$
- 2. I know how to, given a value for $\overline{\mathbf{x}}$ and $\boldsymbol{\sigma}$, note their position on a normal curve. Ex1 Pg 6
- I know how to calculate the 68%, 95% and 99.7% range values when given values for x
 and σ
 Ex2 Pg 7
 Mock 2015 Q2a
- 4. I know how to find for $\overline{\mathbf{x}}$ or σ , given either one and range values for a particular interval. Ex 3 Pg 7
- 5. I know can solve problems like Q14 on Page 9.
- 6. I know how to find the 'sample' size n.

I know how to find E the Margin of Error using E=



I know that **(p hat) is the 'sample proportion'** and is found dividing the number of whatever by the total number of people surveyed

= number of whatever (said they agreed/disagreed/liked/felt aches)

Total Number surveyed

I know that the 95% Confidence Interval is found using (also known as 5% level of significance)

Confidence interval is $\hat{p} - \frac{1}{\sqrt{p}}$

Where p is the Population Proportion (not normally known) Ex 1 Pg 11

7. Given a Margin of Error as a decimal or a percentage I can find the corresponding sample size n.

Ex 2 Pg 12

- 8. I know what 95% Confidence Interval means in terms of confidence in results of a survey.
- 9. I know how to state the **null hypothesis** H_0 and the **alternative hypothesis** H_1 in given questions. (Tip the alternative often uses the word NOT in the statement)
- 10. I know to use the following steps to test a hypothesis:
 - 1. Write down H₀, the null hypothesis, and H₁, the alternative hypothesis For example, to test whether a coin is biased if we get 7 heads in 10 tosses, we could formulate the following hypotheses:

 H_0 : The coin is not biased.

- H_1 : The coin is biased.
- 2. Write down or calculate the sample proportion, \hat{p} .
- 3. Find the margin of error, $\frac{1}{\sqrt{n}}$.
- 4. Write down the confidence interval for the population proportion, \hat{p} , using

$$\hat{p} - \frac{1}{\sqrt{n}} [or $\hat{p} \pm \frac{1}{\sqrt{n}}$]$$

- (i) If the value of the population proportion stated is within the confidence interval, accept the null hypothesis H₀ and reject H₁.
 - (ii) If the value of the population proportion is outside the confidence interval, reject the null hypothesis H₀ and accept H₁.

Ex 1 and 2 Pg 16 Mock 2015 Q2b