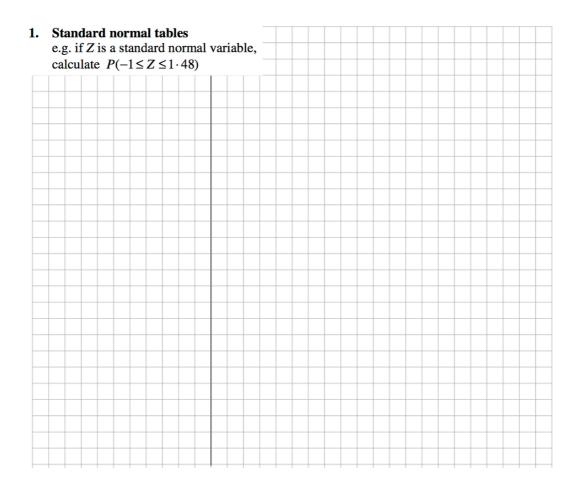
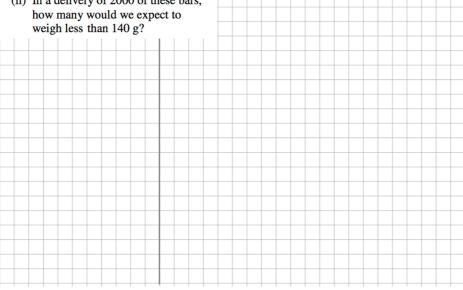
## **Inferential Statistics Revision Questions**



LC HL Project Maths 2015



- 2. Other normal distributions
  - e.g. A certain brand of chocolate bar has weight which is normally distributed with mean 150 g and standard deviation 5 g.
  - (i) What is the probability that a bar of chocolate chosen at random has a weight less than 140 g?
  - (ii) In a delivery of 2000 of these bars, how many would we expect to



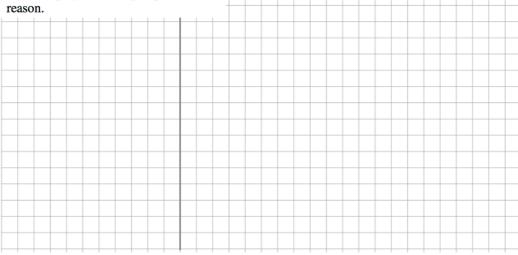
#### 3. Empirical rule

e.g. X is a continuous random variable which is normally distributed with mean 5.6 and standard deviation 0.8. Calculate  $P(4 \cdot 8 \le X \le 7 \cdot 2)$ , i.e. the probability that X lies between  $4 \cdot 8$  and  $7 \cdot 2$ , using the empirical rule.



### 4. Relative standing

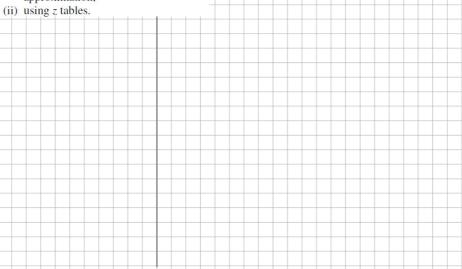
e.g. Paul plays an online game against many other players. On Monday, he scores 21050 and is told that for his group of players the mean and standard deviation are 19550 and 780 respectively. On Tuesday, he plays again against the same group of players. This time he scores 20440, and is informed that the mean and standard deviation are 19400 and 580 respectively. On which day did Paul perform better relative to the other players in his group? Give a reason.

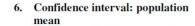


# 5. Confidence interval: population proportion

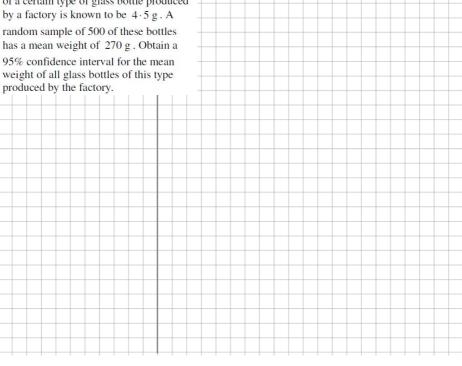
e.g. A survey of 1200 consumers indicates that 525 intend to buy a new brand of dairy spread. Find the 95% confidence interval for the true proportion of consumers that intend to buy the new brand

(i) using the margin of error approximation,



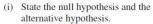


e.g. The standard deviation of the weight of a certain type of glass bottle produced



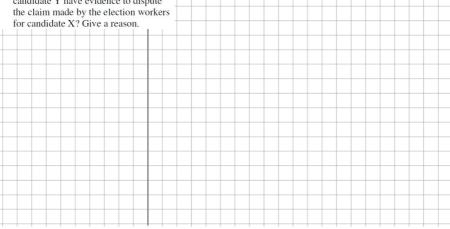
#### 7. Hypothesis testing: population proportion

e.g. Election workers for a candidate, X, in an election have confidently predicted that she will gain 45% of the first preference votes and so top the poll. To test this claim, the workers for another candidate, Y, take a random sample of 1024 voters. This sample suggest that the support for candidate X is at 42%.



(ii) On what basis should the hypothesis be rejected or not rejected?

(iii) Do you think the election workers for candidate Y have evidence to dispute



8. Hypothesis testing: population mean
e.g. A car battery manufacturer claims that
the average life of the batteries they
produce is 4·6 years, with a standard
deviation of 0·8 years. To test this claim,
a random sample of 120 batteries was
tested and their average life was found to
be 4·8 years. Determine if there is enough
evidence to conclude to conclude that the
claim made by the battery manufacturer is
not true, at the 5% level of significance.