

UNIVERSITY OF WARWICK
DEPARTMENT OF ECONOMICS
STATISTICAL TECHNIQUES B

Diploma Exercise Sheet 4: Special and Probability distributions

1. Suppose the probability is 0.5 that the value of the \$US will rise against the Japanese yen over any given week, and that the outcomes week on week are independent.
 - (a) What is the probability that the value of the \$US will rise against the Japanese yen in a majority of the weeks over a period of 7 weeks?
 - (b) What is the probability that the value of the \$US will rise against the Japanese yen in each of the 7 weeks?
 - (c) What is the probability that the value of the \$US will rise against the Japanese yen more than once in the 7 weeks?

2. A university health centre receives walk-in patients at an average rate of 5 per minute, during mid-day hours.
 - (a) Find the probability that there will be fewer than 2 walk-in patients in a particular mid-day hour.
 - (b) Find the probability that there will be more than 8 walk-in patients in a particular mid-day hour.
 - (c) Find the probability that there will be between 2 and 5 walk-in patients in a particular mid-day hour.

3. Let the random variable, Z , follow a standard normal distribution:
 - (a) Find $P(Z > -1.00)$
 - (b) Find $P(-1.70 < Z < 1.20)$
 - (c) Find a such $P(Z < a) = 0.70$
 - (d) Find a such $P(Z < a) = 0.25$

4. Anticipated consumer demand for a product next month can be represented by a normal distribution with mean 1,200 units and standard deviation, 100 units.
- (a) What is the probability that sales will exceed 1000 units?
 - (b) What is the probability that sales will be between 1100 and 1300 units?
 - (c) The probability is 0.10 that sales will be more than how many units?
5. A lecturer found that time spent by students on an exercise sheet follow a normal distribution with mean 60 minutes and standard deviation 18 minutes.
- (a) The probability is 0.9 that a randomly chosen student spends more than how many minutes on this exercise sheet.
 - (b) The probability is 0.8 that a randomly chosen student spends less than how many minutes on this exercise sheet.
 - (c) Two students are chosen at random. What is the probability that at least one of them spends at least 75 minutes on the exercise sheet?