1)   Observations of the weights w (in Newtons) of two hundred (200) test cables after
      two weeks of immersion in a corrosive fluid are summarized in this frequency table:

Weight w (N)	Frequency f	wf	w^2f	
$0 \le w < 50$	53	1325	33125	
$50 \le w < 100$	62	4650	348750	
$100 \le w < 150$	28	3500	437500	
$150 \le w < 200$	24	4200	735000	
$200 \le w < 300$	21	5250	1312500	
$300 \le w < 400$	7	2450	857500	
$400 \le w < 600$	5	2500	1250000	
Total	200	23875	4974375	

(a) Identify the median class.   [2]
(b) Estimate the sample mean weight $\bar{w}$ from this frequency table. *Show your working*.   [2]
(c) Estimate the sample standard deviation s_w from this frequency table. *Show your working*.[4]
(d) Do these data provide evidence for positive skew, negative skew or no skew?   [2]
(e) Explain briefly why the graph below of the data is **not** a histogram.   [2]
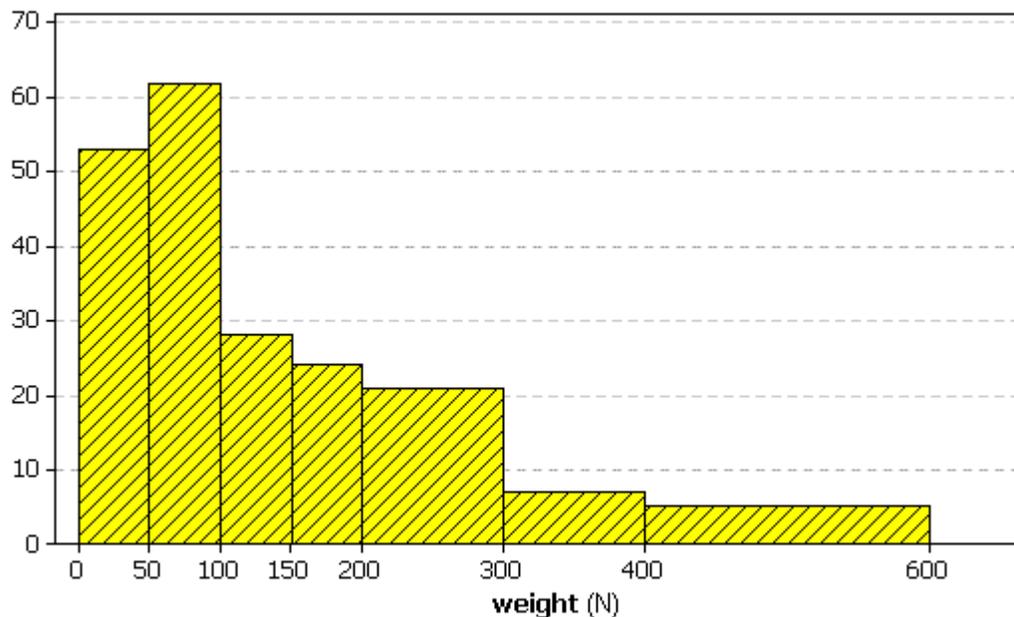
2)   Events A, B, C form a partition.   A bookmaker offers the following odds:
      $r_A = 3{:}1$ on, $r_B = 7{:}5$ against   and $r_C = 2{:}1$ against

  (a) Show that the corresponding probabilities are not coherent.   [4]
  (b) If a deposit of $10 is placed on each of the three outcomes with the quoted odds, then
       what is the bookmaker's profit (or loss) if event B occurs?   [3]
  (c) Rescale the three probabilities so that they are coherent.   [3]
  (d) Convert the coherent probabilities back into odds.   [3]

3)   A quality control system rejects an item that is defective 98% of the time.
      It rejects a good item 6% of the time.   It is known that 5% of all items are defective.

  (a) Given that an item has been rejected, find the probability that it is defective.   [8]
       Express your answer as a fraction reduced to its lowest terms **and** as a decimal
       correct to two significant figures.
BONUS QUESTION
  (b) Given that the quality control system has tested the item twice in independent tests
       and has rejected it both times, find the probability that the item is defective.   [+3]
       Express your answer as a decimal correct to two significant figures.

4)   It is known that   [7]
      $P[A] = .60,$ $P[B] = .55,$ $P[C] = .50,$
      $P[AB] = .40,$ $P[BC] = .30,$ $P[CA] = .25$ and $P[ABC] = .20.$
      Find the probability that **none** of events A, B, C occur.