BECA / IB Math 02-Descriptive Statistics
19 November 2021

Name: SOLUTIONS

2.3 Quiz: Box and whisker plots

1. Determine whether each set of data is quantitative or categorical, and discrete or continuous by circling the appropriate labels.

   (a) The favorite ice cream flavors of 20 people
   quantitative categorical; discrete continuous

   (b) The genres of 20 top movies
   quantitative categorical; discrete continuous

   (c) The number of kittens in each of 50 litters
   quantitative categorical; discrete continuous

   (d) The number of empty beds in a hospital during flu season
   quantitative categorical; discrete continuous

   (e) The number of students in the 9th, 10th, and 11th grades
   quantitative categorical; discrete continuous

   (f) The weight of each bag of skittles
   quantitative categorical; discrete continuous

2. Find the 5-figure summary statistics of the following data:

   15 4 13 6 15 12 9 7 3

   (a) Rewrite the data in order. 3, 4, 6, 7, 9, 12, 13, 15, 15
   (5 under 9, 14 under 13)

   (b) Minimum = 3

   (c) 1st Quartile = 5

   (d) Median = 9

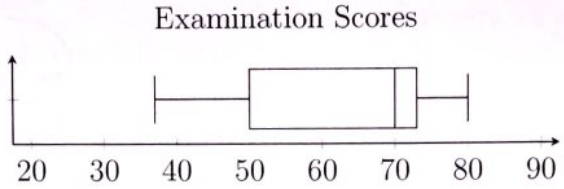
   (e) 3rd Quartile = 14

   (f) Maximum = 15

   (g) Range = $15 - 3 = 12$

   (h) IQR = $14 - 5 = 9$

3. The box-and-whisker plot represents the examination scores of a group of students.



(a) Write down each value:

i. median = 70 ii. Q_1 = 50 iii. max = 80

The range of the scores is 43 marks, and the interquartile range is 23 marks.

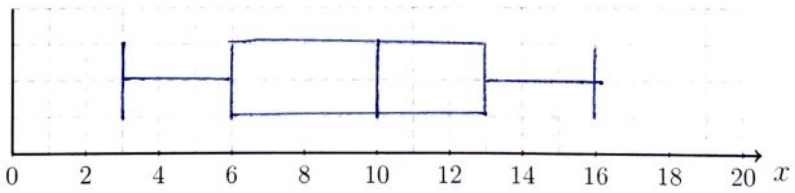
(b) Find the value of

i. the minimum score; $80 - 43 = 37$

ii. the third quartile. $50 + 23 = 73$

4. Draw a box and whiskers plot of the five-figure summary on the grid. Use a ruler for full credit.

min = 3, $Q_1 = 6$, median = 10, $Q_3 = 13$, maximum = 16



5. Find the mean of the following set of numbers (show the substitution of the values into the formula for full credit):

109, 110, 114, 115, 117

$$\bar{x} = \frac{109 + 110 + 114 + 115 + 117}{5} = \frac{565}{5} = 113$$

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6. Given the following set of 15 data:

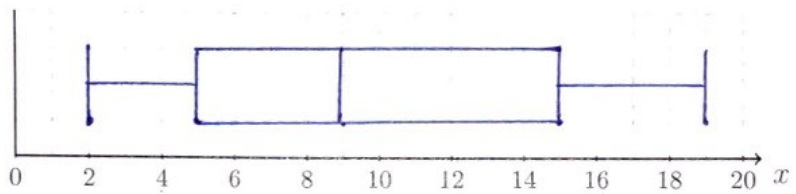
2, 4, 4, 5, 5, 6, 8, 9, 11, 11, 15, 15, 15, 16, 19

(a) Write down the mode 15

(b) Find the median. 9

(c) Find the interquartile range. $15 - 5 = 10$

(d) Draw a box and whiskers plot of the data on the axis below.



(e) Find the mean.

$\bar{X} = \frac{2+4+4+\ldots+15+16+19}{15} = \frac{145}{15} = 9.6\bar{6} \approx 9.67$

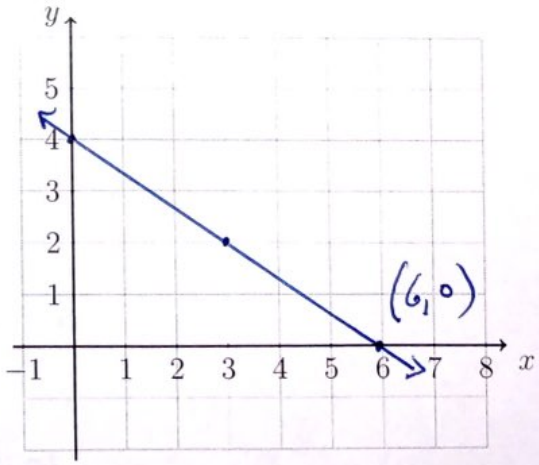
7. Given the linear function $f(x) = -\frac{2}{3}x + 4$.

(a) Write down it's slope.
$m =$ $-\frac{2}{3}$

(b) Write down it's y-intercept.
$b =$ 4

(c) Draw the function f on the grid.

(d) Label the x-intercept with its coordinates as an ordered pair.

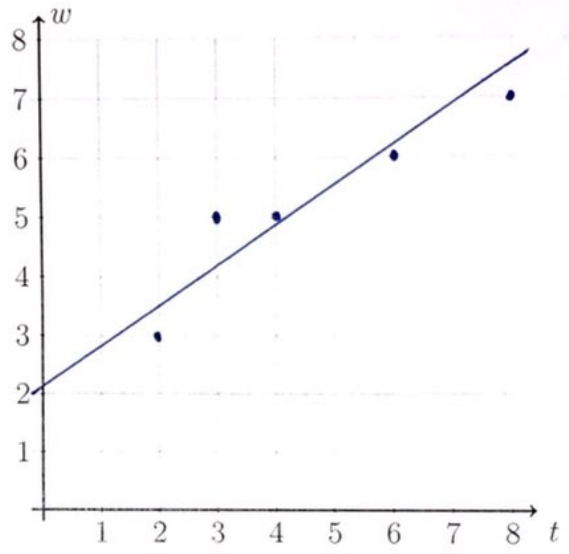


8. The weight of a pumpkin w in pounds over a period of time t measured in weeks is shown in the table.

   (a) Plot the data as points on the grid.

   (b) Draw a line of best fit on the graph.

t	w
2	3
3	5
4	5
6	6
8	7



Arithmetic sequences

Terms: $u_n = u_1 + d(n-1)$

Sum: $S_n = \frac{n}{2}(u_1 + u_n)$

9. Given the arithmetic sequence $11, 17, 23, 29, \ldots$

   (a) Find the common difference d.

   $d = 17 - 11 = 6$

   (b) Write down the next term, u_5.

   $u_5 = 6 + 29 = 35$

   (c) Find the tenth term.

   $u_{10} = 11 + 6(10-1) = 65$

   (d) Find the sum of the first ten terms.

   $u_{10} = \frac{10}{2}(11+65) = 380$