Grade 9 - Mathematics

Organising and Representing Data 4

Memo

1. The table represents examination percentages obtained by a Grade 9 class

30	26	41	95	54	36	16	26	31	39
47	71	42	51	35	33	33	41	15	29
55	63	29	28	81	52	45	42	28	

a. Order the data
b. Find the median
c. Find Q_1.
d. Find Q_3
e. Determine the interquartile range.
f. Determine whether the data is bunched or dispersed.
g. State the outliers, if any.
h. Divide the data into classes of 10% ranges.
i. Draw up a frequency table.
j. Determine the modal class.
k. Use the frequency table to calculate the estimated mean.

a. 15; 16; 26; 26; 28; 28; 29; 29; 30; 31; 33; 33; 35; 36; 39; 41; 41; 42; 42; 45; 47; 51; 52; 54; 63; 71; 81; 95

b. $\frac{n+1}{2}$
$= \frac{29+1}{2}$
$= \frac{30}{2}$
$= 15^{th}$ value
39

c. $Q_1 = \frac{n+1}{4}$
$= \frac{30}{4}$
$= 7,5$
Between 7^{th} and 8^{th} value
Between 29 and 29 = 29

d. $Q_3 = \frac{3(n+1)}{4}$
$= \frac{90}{4}$
$= 22,5$
Between 22nd and 23rd value
Between 51 and 52 = 51,5

e. $Q_3 - Q_1$
$= 51,5 - 29$
$= 22,5$

f. Q_1 - (1,5 x IQR)
$= 29 - (1,5 \times 22,5)$
$= 29 - 33,75$
$= - 4,75$

Q_3 + (1,5 x IQR)
$= 51,5 + (1,5 \times 22,5)$
$= 51,5 + 33,75$
$= 85,25$

The data to the left of the median is bunched but to the right of the median it is dispersed.

g. There is one outlier, which is the value of 95

h. The data classes would be 0-10; 11-20; 21-30; 31-40; 41-50; 51-60; 61-70; 71-80; 81-90; 91-100.

i. Frequency table

Class interval	Frequency
0 – 10	0
11 – 20	2
21 – 30	7
31 – 39	6
41 – 50	6
51 – 59	3
60 – 69	1
70 - 79	1
80 – 89	1
90 - 100	1

j. The modal class is the 21 – 30 data class

k. Frequency table

Class interval	Frequency	Midpoint	Freq x Midpoint
1 – 10	0	5,5	0
11 – 20	2	15,5	31
21 – 30	7	25,5	178,5
31 – 39	6	35,5	213
41 – 50	6	45,5	273
51 – 59	3	55,5	166,5
60 – 69	1	65,5	65,5
70 - 79	1	75,5	75,5
80 – 89	1	85,5	85,5
90 - 100	1	95,5	95,5

Estimated mean = sum of fx ÷ number of values
= 1184 ÷ 29
= 40,8

l. The modal class is 0 – 29

m. Estimated Mean

Class interval	Frequency	Midpoint	Freq x Midpoint
0 - 29	33	14,5	478,5

30 – 49	8	39,5	316
50 - 69	17	59,5	1011,5
70 – 89	12	79,5	954
90 – 109	15	99,5	1492,5
110 – 129	10	119,5	1195
130 – 149	5	139,5	697,5
150 – 169	2	159,5	319
170 - 189	2	179,5	359

Add all fx values
488,5 + 316 + 1011,5 + 954 + 1492,5 + 1195 + 697,5 + 319 + 359
= 6833

Divide by total number of elements in the data: (104)
6833 ÷ 104 = 65,7cm

n. Median = $\frac{n+1}{2}$
$= \frac{104+1}{2}$
$= \frac{105}{2}$
= 52,5
The median is between the 52nd and 53rd value. It will be in the 50 – 69 range. It can be estimated as being 59,5.

o. The mode will probably be in the 0 – 29 class due to it having the highest frequency but due to the fact that no individual readings are given it would be impossible to determine the actual mode.