



Means, Modes and Medians - Solutions

TASK A

1. The dataset below shows the average time taken to travel to school in seconds for 8 learners, taken from *CensusAtSchool* 2012/2013. What is the mean?

8	12	5	10	25	13	10	6
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$$\frac{8 + 12 + 5 + 10 + 25 + 13 + 10 + 6}{8} = 11.1 \text{ (1d.p.)}$$

2. The dataset below shows wrist measurements (in cm) taken from a random sample of learners from *CensusAtSchool* 2012/2013. What is the mean?

18	15	15	14	15	17	16	12	14	14
17	16								

$$\frac{18 + 15 + 15 + 14 + 15 + 17 + 16 + 12 + 14 + 14 + 17 + 16}{12} = 15.3 \text{ (1d.p.)}$$

3. The dataset below shows the method of transport used to travel to school for 19 randomly selected learners from *CensusAtSchool* 2012/2013. What is the modal group?

Walk	Walk	Walk	Car	Bus
Rail	Bus	Car	Bus	Car
Walk	Car	Car	Bus	Bus
Car	Car	Cycle	Bus	

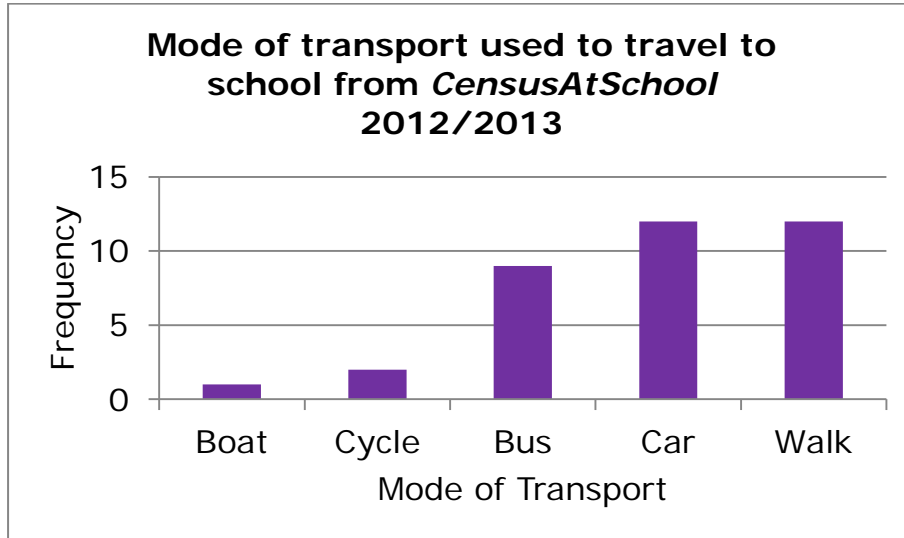
Walk	Car	Bus	Rail	Cycle
Walk	Car	Bus		
Walk	Car	Bus		
Walk	Car	Bus		
	Car	Bus		
	Car	Bus		
	Car			

The modal group is car.



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4. What is the modal group of the data shown in the bar chart below?



There are two modal groups - Car and Walk.

5. As stated previously, the median is the middle observation. Complete the table below to work out where the middle position is located. In the last column you will need to work out the following, where n is the total number of learners:

$$\frac{n + 1}{2}$$

Example: For 15 learners

$$\frac{15 + 1}{2} = \frac{16}{2} = 8$$

Number of learners (n)	Middle learner	$\frac{n + 1}{2}$
3		2
6		3.5 (between 3 and 4)
11		6
15		8
1290		645.5 (between 645 and 655)



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6. You need to find the median of a large dataset with 36,687 observations. At which position would the median lie in the ordered data?

$$\frac{36687 + 1}{2} = 18344$$

7. Below are scores for 10 randomly selected 14 year olds from the *WinAtSchool* Competition. What is the median?

32	40	28	27	8	20	12	8	4	12
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4	8	8	12	12	20	27	28	32	40
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$$\frac{10 + 1}{2} = 5.5$$

Halfway between the 5th and 6th observations is: $\frac{12+20}{2} = 16$

TASK B

1. Complete the table below for the grouped dataset, which shows the time taken to travel to school for 250 learners from *CensusAtSchool* 2012/2013. Find the mean, median and modal group.

Time (minutes)	Midpoint (x)	Frequency (f)	Cumulative Frequency	fx
0 - (10)	5	83	83	415
10 - (20)	15	76	159	1140
20 - (30)	25	42	201	1050
30 - (40)	35	26	227	910
40 - (50)	45	15	242	675
50 - (60)	55	4	246	220
60 - (70)	65	0	246	0
70 - (80)	75	4	250	300
Total		250		4710

$$\text{Mean} = \frac{4710}{250} = 18.8 \text{ minutes}$$

$$\text{Median: } \frac{250 + 1}{2} = 125.5$$

So we need to look at the 125th and 126th observations. The median time taken to travel to school is 10 to 20 minutes.

Mode: The modal group is 0 to 10 minutes, since this has the largest frequency of 83.