



Definition: the **median** is the number that divides an ordered list of numbers into two equally-sized parts

Definition: the **quartiles**, along with the median, are the numbers that divide an ordered list into four equally-sized parts. The list must be written in order.

Formula. This formula is not given on the National 5 Mathematics exam paper.

Semi Interquartile-Range:
$$SIQR = \frac{\text{upper quartile} - \text{lower quartile}}{2}$$

Example

For the following set of numbers, calculate the median, quartiles and semi inter-quartile range:

12, 14, 15, 15, 16, 17, 17, 19, 19, 20, 21, 22, 26, 28, 31, 31

Solution

First write the list out in order and draw arrows to identify the median and quartiles.

L	lower Q	Median	upper Q	H
12, 14, 15, 15,	16, 17, 17, 19,	19, 20, 21, 22,	26, 28, 31, 31	
	↓	↓	↓	
	15.5	19	24	

Lowest value	L = 12
Lower Quartile	$Q_1 = 15.5$
Median	$Q_2 = 19$
Upper Quartile	$Q_3 = 24$
Highest value	H = 31

Upper quartile = 24 and Lower quartile = 15.5, so $SIQR = \frac{24 - 15.5}{2} = 4.25$

Exercise 1

1. For each of the data sets below find the median, lower quartile, upper quartile and semi-interquartile range.

a)	2	4	4	6	7	8	10	14	15			
b)	29	30	32	33	34	37	40					
c)	17	19	20	22	23	25	26					
d)	0	0	0	1	1	2	2	2	3	3	4	
e)	1.8	1.8	2.8	2.9	4.0	4.0	4.0	4.7	5.1	5.2	5.3	
f)	0.13	0.18	0.18	0.19	0.25	0.26	0.29	0.29	0.30	0.31	0.33	0.39
g)	133	136	136	138	140	141	143	145				
h)	371	375	376	379	380	384	385	387	389	390		
i)	57	58	58	60	63	67	67	69	82	85	86	90
j)	11	11	11	12	13	14	15	15	16	18	20	

2. For each of the data sets below find the median, lower quartile, upper quartile and semi-interquartile range.

a)	47	56	58	48	60	65	50	52	61	53	63	
b)	12	20	27	15	35	16	26	34	38	24	26	
c)	149	165	154	167	170	179	151	168	158			
d)	1	8	3	1	2	5	3	1	4	3	2	
e)	108	114	132	95	144	120	116	125	172	188	155	160
f)	65	74	59	43	63	52	48	63	67	85	92	48
g)	190	165	174	187	166	172	184	190	166	183	180	
h)	325	363	347	359	314	329	364	372	301	317	346	
i)	0.5	1.3	0.4	1.0	0.9	1.4	0.8	0.9	1.1	0.6		
j)	10	13	11	11	20	10	10	14	50	10	11	10

Answers

Exercise 1

1.	median	Q1	Q3	SIR	2.	median	Q1	Q3	SIR
a)	7	4	12	4	(a)	56	50	61	5.5
b)	33	30	37	3.5	(b)	26	16	34	9
c)	22	19	25	3	(c)	165	152.5	169	8.25
d)	2	0	3	1.5	(d)	3	1	4	1.5
e)	4.0	2.8	5.1	1.15	(e)	128.5	115	157.5	21.25
f)	0.275	0.185	0.305	0.06	(f)	63	50	70.5	10.25
g)	139	136	142	3	(g)	180	166	187	10.5
h)	382	376	387	5.5	(h)	346	317	363	23
i)	67	59	83.5	12.25	(i)	0.9	0.6	1.1	0.25
j)	14	11	16	2.5	(j)	11	10	13.5	1.75