S2 Block Test Two
Revision Booklet
MP1

Ratio/Proportion

Exercise 2

1. Simplify each ratio as far as possible :-

   a 40 : 20 **b** 50 : 15 **c** 60 : 12 **d** 12 : 36 **e** 125 : 25 **f** 84 : 7

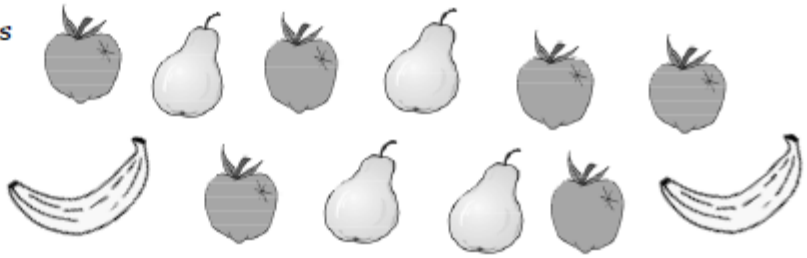
   g 11 : 99 **h** 18 : 32 **i** 12 : 132 **j** 64 : 36 **k** 3 : 51 **l** 18 : 162.

2. Write each of these ratios in its simplest form :-

   a apples : pears

   b bananas : pears

   c fruit : apples.



3. Seth has 60 squigglies, Ed has 36, Ted has 24 and Zed has 10.

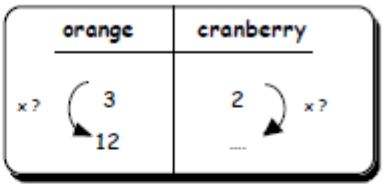
   Write down the ratio of squigglies in their simplest form for :-

   a Seth : Ed **b** Ted : Zed **c** Seth and Ted : Ed and Zed.

Exercise 3

1. Jenny wants to make punch for her party.

   She mixes 3 glasses of orange juice to 2 glasses of cranberry, (*ratio of 3:2*).



   If she uses 12 glasses of orange, how many glasses of cranberry does she need ?

2. Wendy the witch uses 3 parts (magic) dust to 4 parts slime for her superbrew.

   How many parts slime does Wendy need for :-

   a 6 parts dust **b** 21 parts dust **c** 51 parts dust **d** 4·5 parts dust ?

3. In an orchard, the ratio of red apples to green apples is 7 : 4. If there are :-

   a 21 red apples, how many are green ? **b** 84 red apples, how many are green ?

   c 32 green apples, how many are red ? **d** 52 green apples, how many are red ?

Ratio/Proportion

Exercise 4

1. a A car travels 550 kilometres on 50 litres of petrol.
   Calculate the rate in "kilometres per litre."

   b A postman delivers 42 parcels in 6 minutes.
   Calculate the rate of parcels/minute.

   c It takes a snail 6 minutes to travel 240 centimetres.
   Calculate the rate in centimetres/minute.

2. Eight bags contain 96 marbles. Calculate the rate of marbles per bag.

3. £10 can be exchanged for 18·47 Australian dollars.
   Calculate the rate of dollars per £.

4. In the tortoise race final :-

Tina travelled 100 centimetres in 5 minutes.
Tank travelled 66 centimetres in 3 minutes.
Troy travelled 70 centimetres in $3\frac{1}{2}$ minutes.

   a For each tortoise, find the speed in centimetres/minute.

   b Who was the fastest tortoise ?

Exercise 5

1. a 5 magazines cost £8·15. What would 4 cost ?

   b 8 litres of petrol costs £10·56. What would 9 litres cost ?

   c 15 cm^3 of plastic weighs 285 grams. What would 16 cm^3 weigh ?

2. A three kilogram roast of beef takes $2\frac{1}{2}$ hours to cook.
   How long would it take a four kilogram roast ? (Hint:- *change time to minutes*).

3. In **one year**, poison ivy can grow 6 metres.
   How long would you expect it to grow on average in **7 months** ?

Answers

Exercise 2

1. a 2 : 1 b 10 : 3 c 5 : 1 d 1 : 3
   e 5 : 1 f 12 : 1 g 1 : 9 h 9 : 16
   i 1 : 11 j 16 : 9 k 1 : 17 l 1 : 9
2. a 3 : 2 b 1 : 2 c 2 : 1
3. a 5 : 3 b 12 : 5 c 42 : 23

Exercise 3

1. 8
2. a 8 b 28 c 68 d 6
3. a 12 b 48 c 56 d 91

Exercise 4

1. a 11 b 7 c 40
2. 12
3. 1·847
4. a Tina - 20 cm/min Tank - 22 cm/ min
   Troy - 20 cm /min b Tank

Exercise 5

1. a £6·52 b £11·88 c 304 grams
2. 200 mins = 3 hrs 20 mins
3. 3·5 metres

Indirect Proportion

Exercise 8

1. If it takes 5 men 12 hours to paint a fence, how long would it take 6 men ?

   Set down your answer as shown opposite.
   (*Don't forget to check : **more** men - **less** time*).

Men		Hours	
5	→	12	
1	→	5 × 12	= ...
6	→	... ÷ 6	= ...

2. 

   If it takes 6 men 8 hours to erect a fence, how long would it take 5 men to erect the fence ?

   (*Check : this time that **less** men → **more** time*).

3. An aeroplane takes 5 hours for a journey at an average speed of 240 km /hr.

   At what speed would the aeroplane have to travel to cover the same journey in 3 hours ?

4. 

   Terri reads at a rate of 250 words per minute and takes 6 hours to read a book.

   How long would it have taken her to read the book at 300 words per minute ?

5. It takes 5 girl guides 1 hour to pitch a large tent.

   How long would it take 8 girl guides working at the same rate ?

6. A squad of five soldiers have enough rations for 12 days. Ten other soldiers with no extra food join the squad.

   How many days will the rations now last the group ?

7. 

   Jason has enough fish food to feed his 20 tropical fish for 3 weeks.

   If he sells 5 of his fish, how long will the fish food last ?

8. An architect estimated it would take 15 men 10 months to build a block of flats.

   The builder needs to do the job in 6 months.

   How many **extra** men does the builder need to complete the job on time ?

Answers

Ch 41 Ex 8 (Page 168)

1. 10 hr
2. 9·6 hours (or 9 hr 36 min)
3. 400 km/hr
4. 5 hr
5. 37·5 min
6. 4 days
7. 4 weeks
8. 10 more men

Integers

Exercise 3 Subtracting Negatives

1. Find :-

a	4 - (-2)	b	8 - (-1)	c	10 - (-5)	d	70 - (-30)
e	(-3) - (-2)	f	(-1) - (-1)	g	(-8) - (-7)	h	(-11) - (-6)
i	(-34) - (-21)	j	(-121) - (-77)	k	73 - (-54)	l	(-243) - (-233).

2. Find :-

a	$4x - (-2x)$	b	$7y - (-4y)$	c	$23k - (-14k)$	d	$156i - (-127g)$
e	$111d - (-88d)$	f	$(-3w) - (-4w)$	g	$(-40j) - 11j - (-20j)$.		

Exercise 4 Multiplying/Dividing Negatives

1. Find :-

a	3 x (-2)	b	8 x (-1)	c	12 x (-5)	d	10 x (-30)
e	(-3) x 4	f	(-1) x 6	g	(-8) x 7	h	(-11) x 4
i	(-9) ÷ 3	j	(-121) ÷ 11	k	72 ÷ (-9)	l	243 ÷ (-3).

2. Find :-

a	(-4) x (-2)	b	(-3) x (-4)	c	(-7) x (-9)	d	(-11) x (-12)
e	15 ÷ (-5)	f	(-30) ÷ (-5)	g	(-40) ÷ (-8)	h	(-243) ÷ (-3).

3. Find :-

a	(-11 + 3) x 2	b	(7 - 11) x 5	c	$(-1)^{17}$	d	(-1) x (-7) x (-2).

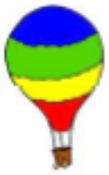
Exercise 5 Mixed Exercise

1. Find :-

		a	-3 + 8	b	8 - (-2)	c	9 + (-3) - (-5)		
d	5 x (-4)	e	(-3) x 6	f	(-5) x (-7)	g	35 ÷ (-5)		
h	(-64) ÷ (-8)	i	$(-1)^{191}$	j	$(-1)^9 \times (-1)^{11}$	k	(-10) x (-1) ÷ (-2).		

2. For every 100 m a weather balloon rises the temperature drops by 2·5°C.

If at ground level the temperature is 11°C, what would the temperature be at a height of 2·1 km ?



Answers

Exercise 2 - Adding and Subtracting Integers

1.	a	-1	b	-5	c	2	d	-2
	e	0	f	-6	g	-13	h	-4
	i	-100	j	-31	k	-70	l	-90
2.	a	-87	b	-1·5	c	3·9	d	-5·2
	e	-2·1	f	27	g	-38·2		
	h	$-k$	i	$-10g$	j	$2t$		

Exercise 3 - Subtracting Negatives

1.	a	6	b	9	c	15	d	100
	e	-1	f	0	g	-1	h	-5
	i	-13	j	-44	k	127	l	-10
2.	a	$6x$	b	$11y$	c	$37k$	d	$283i$
	e	$199d$	f	w	g	$-31j$		

Exercise 4 - Multiplying/Dividing Negatives

1.	a	-6	b	-8	c	-60	d	-300
	e	-12	f	-6	g	-56	h	-44
	i	-3	j	-11	k	-8	l	-81
2.	a	8	b	12	c	63	d	132
	e	-3	f	6	g	5	h	81
3.	a	-16	b	-20	c	-1	d	-14

Statistics

Exercise 1

1. Calculate the **mean** for each set of data :-

   (a) 3, 8, 4, 2, 10, 7, 8

   (b) 50, 60, 52, 58, 54, 56

   (c) 1·3, 2·6, 3·2, 4·1, 5, 4·8, 4, 1·9, 0·1, 2

   (d) the first ten prime numbers.

2. Find the **median** for each set of data :-

   (a) 1, 3, 5, 6, 8, 11, 14

   (b) 16, 22, 23, 25, 31, 40, 61, 63

   (c) 4, 1, 14, 12, 6, 7, 11, 13, 9

   (d) 5, 8, 21, 12, 5, 16, 33, 12, 15, 9.

3. Find the **mode** for each set of data :-

   (a) 1, 1, 2, 3, 5, 8, 13, 21, 34, 55

   (b) 3, 2, 1, 8, 4, 5, 9, 2, 7, 6, 0,

   (c) 1·7, 2·3, 1·6, 3, 2·3, 3·7, 2·9,

   (d) A, C, F, G, H, Y, T, E, D, D, G, H, G.

4. Find the **range** for each set of data in question 3(a) to (c).

5. Find the **mean**, **median**, **mode** and **range** of each set of data :-

   (a) 10, 14, 15, 15, 16, 19, 22, 23, 27, 29, 30

   (b) 46, 31, 66, 73, 83, 43, 16, 66

   (c) All the prime numbers between 30 and 50.

6. 

   The mean weight of 4 boxes is 300 kg.
   Three of the boxes each weigh 85 kg.
   What is the weight of the fourth box ?

Statistics

1. The data below shows the number of cars parked on a main street each day at lunchtime.

16	11	32	40	65	32	33	18	12	6	23
57	16	54	42	67	32	78	47	49	52	70
16	38	7	13	35	79	71	52	24	15	10

Class Intervals	Tally	Frequency
0 - 9		
10 - 19	COPY	
20 - 29		
30 - 39		
40		

(a) **COPY** and complete the frequency table.

(b) On how many days was data collected ?

(c) On how many days were there more than 30 cars parked at lunchtime ?

2. Shown is the number of children attending football training each week.

22	3	5	17	24	17	4	11
10	18	8	26	19	19	23	9
13	23	13	22	26	9	23	15
2	18	17	15	26	11	19	10
12	10	19	11	14	6	7	20

(a) Which of these would be the most suitable class interval to use :-

(0 - 9) or (0 - 4) or (0 - 1) ?

(b) Construct a frequency table using your chosen class interval.

3. For each set of data below, choose a suitable class interval and construct a frequency table.

(a)

13	4	41	69	51	58	57	33
11	40	46	61	22	22	52	63
14	53	46	54	42	56	60	54
50	29	43	13	46	17	25	21
25	36	39	20	7	11	14	6

(b)

20	18	5	18	13	9	11	21
7	17	8	22	13	23	4	19
6	15	13	26	10	19	17	22
14	26	10	8	18	19	24	3
11	11	15	23	8	26	17	5

(c)

2·9	5·7	5·1	4·9	3·0	1·1	2·4	6·8	0·9	5·5	1·7	6·2
0·5	6·3	4·5	3·4	5·6	3·1	3·4	4·6	3·7	2·5	1·6	3·7
5·0	2·9	4·3	2·1	5·4	4·6	5·3	6·1	2·2	5·7	5·8	1·3

Statistics

Exercise 4

1. A gardener recorded the number of **new** dandelions that appeared in his lawn each week over a 7 week period.

   He began to use a weed killer and studied the results.

   (a) Copy and complete the table.

   (b) Which week did the gardener start using the weedkiller ?

   (c) Find the median.

Week	Frequency (new weeds)	Cumulative freq. (total so far)
1	3	3
2	12	15
3	36	..
4	68	..
5	40	..
6	12	..
7	1	...

2. For each table below :-

   (i) add a cumulative frequency column (ii) find the median.

(a)

Goals	Frequency
0	1
1	4
2	12
3	11
4	8
5	6
6	0

(b)

Score	Frequency
0	2
1	3
2	5
3	15
4	18
5	6
6	2

(c)

No.	Frequency
10	3
11	3
12	12
13	16
14	15
15	24
16	35

Exercise 5

1. The table shows the results of a questionnaire asking a group of 90 pupils their favourite bedtime drink.

   (a) **COPY** and complete the table.

   (b) Construct an accurate pie chart using a pair of compasses, a protractor and the table information.

Drink	Number	Fraction	Angle
Water	10	$\frac{10}{90}$	$\frac{10}{90} \times 360 = 40°$
Chocolate	15	$\frac{15}{90}$	$\frac{15}{90} \times 360 = \ldots\ldots°$
Milk	30	$\frac{\ldots\ldots}{90}$	$\frac{\ldots\ldots}{90} \times 360 = \ldots\ldots°$
None	35	$\frac{\ldots\ldots}{90}$	$\frac{\ldots\ldots}{90} \times 360 = \ldots\ldots°$
TOTAL	**90**	**1**	**360°**

Statistics

2. For each table below, construct an accurate pie chart, showing all your working.

(a)

Favourite pet	Number
Cat	20
Dog	10
Mouse	12
Rabbit	18
TOTAL	....

(b)

People's weight (kg)	Number
30 - 50	80
51 - 70	120
71 - 90	480
91 - 110	40
TOTAL	....

3. The table shows the results of a survey asking how old people were when they first went to the cinema.

9	8	6	7	5	6	9	5	6	5	5	6
5	9	7	6	9	7	6	9	9	6	5	5
5	6	7	6	8	6	8	7	6	6	8	6

Construct a **pie chart** to show this information.

Exercise 6

1. The stem and leaf diagram shows the ages of spectators watching a football match.
   (a) Write a key for the diagram.
   (b) Write out all the ages shown in the diagram.
   (c) How old was the youngest spectator ?
   (d) What was the modal age ?
   (e) Find the median.

Spectators ages

1	2 2 6 9
2	0 4 5 6
3	0 1 1 1 2 4
4	2
5	0 3

2. The unordered stem and leaf diagram shows the money donated to a local charity by a Primary seven class.
   (a) **COPY** the diagram, but put the donations in order.
   (b) How many pupils donated money ?
   (c) What was the largest donation ?
   (d) What was the modal donation ?
   (e) Find the average (mean) donation.

Money collected

1	1 7 4 0
2	9 1 3 4
3	9 8 2 3 2 2
4	0
5	3 0

Key :
2 | 9 means £2·90

Statistics

3. For each set of data shown :-

   (i) Construct an ordered stem and leaf diagram. (ii) Find the mode and median.

   (a) Ages of mature students at a University.

23	42	27	37	25	60	29	35	26	45	35	26
50	39	27	26	42	47	26	59	42	23	29	29
20	51	43	44	28	46	42	27	52	30	30	42

   (b) Distances (in metres) jumped from a standing position.

1·62	1·23	1·41	1·15	0·97	1·31	1·23	1·26	1·5
1·33	1·29	1·12	1·23	1·19	1·36	1·53	1·08	1·23
0·9	1·2	1·51	1·03	1·66	1·53	1·44	1·23	1·39

Exercise 7

1. State whether each of the following statements is likely to have a positive correlation, a negative correlation or neither.

   (a) The temperature in a park and the sales of ice-creams.

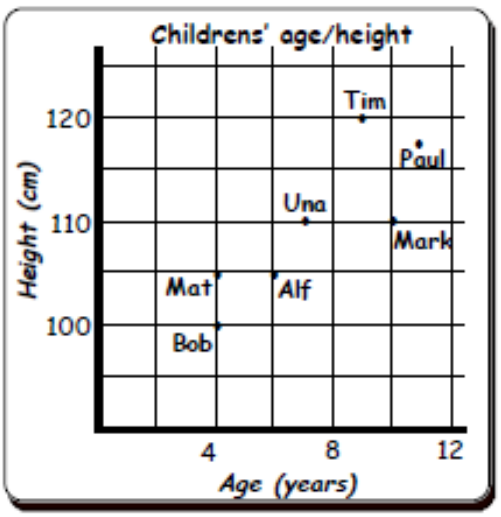
   (b) The amount of sunshine and the sales of umbrella's.

   (c) The distance travelled by an aeroplane and the cost of the flight.

   (d) The number of chairs in a classroom and the number of teachers.

   (e) The cost of a car and the mileage travelled by the car.

2. The scattergraph shows childrens' ages and heights (in cm).



   (a) List the age and height of each person.

   (b) State whether you think there is a positive correlation, a negative correlation or neither.

   (c) **Copy** the scattergraph and draw a line of best fit.

   (d) Use your line of best fit to estimate :-

      (i) the height of Abby aged 9.

      (ii) the age of Alex who is 125 cm tall.

Statistics

3. For each data set, construct a scattergraph and draw a line of best fit :-

(a)

Engine size (1000cc)	1·1	1·1	1·1	1·4	1·4	1·4	1·6	1·6	1·6	1·8	1·8	1·8	2·0	2·0
km / litre	50	60	55	50	40	45	40	30	35	35	25	30	30	20

(b)

Age (years)	5	6	6	7	7	8	9	9	9	10	10	10	11	11	12	12	12	12
Javelin throw (m)	4	5	6	7	5	6	6	8	9	11	12	9	10	11	14	18	15	12

Answers

Exercise 1

1. a 6 b 55 c 2·9 d 12·9
2. a 8 b 28 c 9 d 12
3. a 1 b 2 c 2·3 d 6
4. a 54 b 9 c 2·1
5. a ????? ?????? ???????
   b ????? ?????? ???????
   c ????? ?????? ???????
6. a 945 kg
7. 8

Exercise 2

1. a Freq = 2 9 2 6 4 4 2 4
   b 33 c 20
2. a 0 - 3 b Various
3. a/b/c Various

Exercise 3

1. a Total Freq = 38
   fx = 0 2 22 42 36 Total = 102
   b 38 c 102 d 2·7 ???
2. a 30 in each class b 16·9 & 15·7
   c 17 & 16
3. a Table with 4 @ 13, 6 @ 14, 9 @ 15, 10 @ 16, 11 @ 17.
   bi 17 ii 4 iii 15·45 iv 16

Exercise 4

1. a Cum Freq = 3 15 51 119 159 171 172
   b Week 5 c 68 weeds
2. a Cum Freq = 1 5 17 28 36 42 42
   Median = 3
   b Cum Freq = 2 5 10 25 43 49 51
   Median = 4
   c Cum Freq = 3 6 18 34 49 73 108
   Median = 15

Exercise 5

1. a Angles = 40° 60° 120° 140°
   b Drawing
2. a Angles = 120° 60° 72° 108° Drawing
   b Angles = 40° 60° 240° 20° Drawing
3. Angles = 80° 130° 50° 40° 60° Drawing

Exercise 6

1. a Various eg 2/4 = 24
   b 12 12 16 19 20 24 25 26 30
   31 31 31 32 34 42 50 53
   c 12 d 31 e 30
2. a b 17 c £5·30

1	0 1 4 7
2	1 3 4 9
3	2 2 2 3 8 9
4	0
5	0 3

   d £3·20 e £2·93
3. a

2	0 3 3 5 6 6 6 6 7 7 7 8 9 9 9
3	0 0 5 5 7 9
4	2 2 2 2 2 3 4 5 6 7
5	0 1 2 9
6	0

   Key eg 3/5 = 35
   Mode 42 Median 36·8
   b

0·9	0 7
1·0	3 8
1·1	2 5 9
1·2	0 3 3 3 3 3 6 9
1·3	1 3 6 9
1·4	1 4
1·5	0 1 3 3
1·6	2 6

   Key eg 1/23 = 1·23
   Mode = 1·23 Median 1·23

Exercise 7

Answers

1. a +ve b -ve c +ve d neither
   e -ve
2. a Bob 4/100 cm Mat 4/105 cm
   Alf 6/105 cm Mary 7/110 cm
   Tim 9/120 cm Mark 10/110 cm
   Paul 11/118 cm
   b +ve c **James got original**
   di 115 cm ii 12
3. a

   b

Exercise 8/9

1. a No Chance 0 b Definite 1
   c 50/50 $^1/_2$ d 50/50 $^1/_2$
2. a $^1/_2$ b $^1/_5$ c $^2/_5$ d $^3/_{10}$
3. a $^3/_{40}$ b $^9/_{40}$ c $^3/_{10}$ d $^3/_8$
   e $^1/_{40}$ f $^7/_{10}$ g $^3/_8$ h 0
4. H T (or T H)

Exercise 10

1. a most will say yes b most will say no
   c will say no
2. Various
3. Discrete = Countable No. people in class

   Continuous = Measurable Size of feet
4. Survey

Statistics

Exercise 3

1. A footballer practised taking 4 penalties every day. The table shows the results over several weeks.

   (a) **COPY** and complete the table.

   (b) How many days did he record taking penalties ?

   (c) How many penalties were scored in total ?

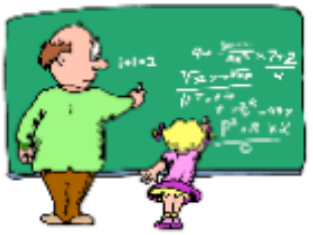
   (d) Calculate the mean number of penalties scored.

No. scored (x)	Freq (f)	$f \times x$
0	2	0 x 2 = 0
1	2	1 x 2 = ...
2	11	2 x .. = ...
3	16	.. x .. = ...
4	9	.. x .. = ...
	...	...

2. Shown are the test scores for classes 2X1 and 2Y1.

2X1 scores (x)	Freq (f)
12	1
14	6
16	8
18	9
20	6

2Y1 scores (x)	Freq (f)
12	5
14	5
16	11
18	8
20	1



   (a) How many pupils are in each class ?

   (b) Find the mean score for each class.

   (c) Find the median score for each class .

3. A group of 18 year old boys were asked how old they were when they went out on their first "date".
   The results are shown in this bar graph.

   (a) Form a frequency table from the information in the bar graph.

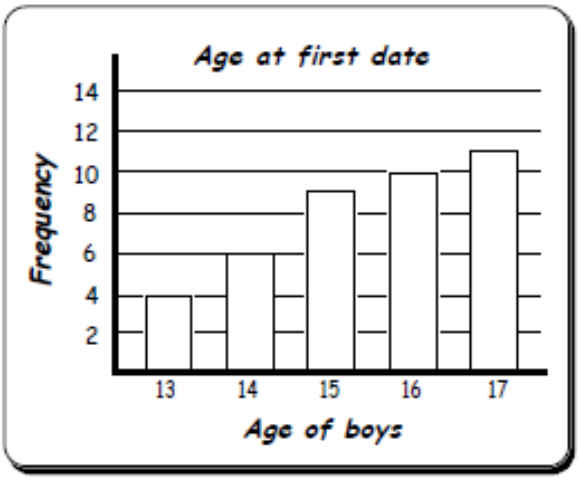
   (b) Calculate the : -

   (i) mode

   (ii) range

   (iii) mean

   (iv) median.



Statistics

Exercise 4

1. A gardener recorded the number of **new** dandelions that appeared in his lawn each week over a 7 week period.

   He began to use a weed killer and studied the results.

   (a) Copy and complete the table.

   (b) Which week did the gardener start using the weedkiller ?

   (c) Find the median.

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2	12	15
3	36	..
4	68	..
5	40	..
6	12	..
7	1	...

2. For each table below :-

   (i) add a cumulative frequency column (ii) find the median.

(a)

Goals	Frequency
0	1
1	4
2	12
3	11
4	8
5	6
6	0

(b)

Score	Frequency
0	2
1	3
2	5
3	15
4	18
5	6
6	2

(c)

No.	Frequency
10	3
11	3
12	12
13	16
14	15
15	24
16	35

Exercise 5

1. The table shows the results of a questionnaire asking a group of 90 pupils their favourite bedtime drink.

   (a) **COPY** and complete the table.

   (b) Construct an accurate pie chart using a pair of compasses, a protractor and the table information.

Drink	Number	Fraction	Angle
Water	10	$\frac{10}{90}$	$\frac{10}{90} \times 360 = 40°$
Chocolate	15	$\frac{15}{90}$	$\frac{15}{90} \times 360 = \ldots\ldots°$
Milk	30	$\frac{\ldots\ldots}{90}$	$\frac{\ldots\ldots}{90} \times 360 = \ldots\ldots°$
None	35	$\frac{\ldots\ldots}{90}$	$\frac{\ldots\ldots}{90} \times 360 = \ldots\ldots°$
TOTAL	**90**	**1**	**360°**



Statistics

Exercise 4

1. A gardener recorded the number of **new** dandelions that appeared in his lawn each week over a 7 week period.

   He began to use a weed killer and studied the results.

   (a) Copy and complete the table.

   (b) Which week did the gardener start using the weedkiller ?

   (c) Find the median.

Week	Frequency (new weeds)	Cumulative freq. (total so far)
1	3	3
2	12	15
3	36	..
4	68	..
5	40	..
6	12	..
7	1	...

2. For each table below :-

   (i) add a cumulative frequency column (ii) find the median.

(a)

Goals	Frequency
0	1
1	4
2	12
3	11
4	8
5	6
6	0

(b)

Score	Frequency
0	2
1	3
2	5
3	15
4	18
5	6
6	2

(c)

No.	Frequency
10	3
11	3
12	12
13	16
14	15
15	24
16	35

Exercise 5

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   (a) **COPY** and complete the table.

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TOTAL	**90**	**1**	**360°**



Answers

Exercise 2

1. a Freq = 2 9 2 6 4 4 2 4
   b 33 c 20
2. a 0 - 3 b Various
3. a/b/c Various

Exercise 3

1. a Total Freq = 38
   fx = 0 2 22 42 36 Total = 102
   b 38 c 102 d 2·7 ???
2. a 30 in each class b 16·9 & 15·7
   c 17 & 16
3. a Table with 4 @ 13, 6 @ 14, 9 @ 15,
   10 @ 16, 11 @ 17.
   bi 17 ii 4 iii 15·45 iv 16

Exercise 4

1. a Cum Freq = 3 15 51 119 159 171 172
   b Week 5 c 68 weeds
2. a Cum Freq = 1 5 17 28 36 42 42
   Median = 3
   b Cum Freq = 2 5 10 25 43 49 51
   Median = 4
   c Cum Freq = 3 6 18 34 49 73 108
   Median = 15