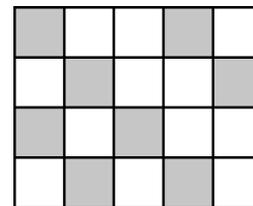


Y10 Foundation Number

- 1 a What fraction of this rectangle is shaded?
 b What percentage of the rectangle is not shaded?
 c Draw a similar rectangle, 5 squares long and 4 squares wide. Shade 65% of the new rectangle.



- 2 On 1 June the number of visitors to a theme park was recorded as 19476.
 a Write the number 19476 in words.
 b What is the value of the digit 4 in this number?
 c Write the number 19476 to the nearest thousand.
 d The next day there were two-and-a-half thousand more visitors than on 1 June. How many visitors went to the theme park on 2 June?
 e Write the number of visitors on 2 June to the nearest 10.

- 3 From the numbers in the rectangle, write down all of the:

- a square numbers
 b cube numbers
 c prime numbers
 d factors of 56
 e multiples of 6.

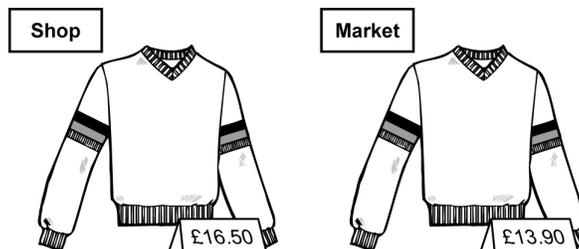
25	17	28	7	8
	36	27	19	42
14	30	64	1	3

- 4 List these fractions in order of size, starting with the smallest.

$$\frac{2}{3} \quad \frac{4}{9} \quad \frac{5}{6} \quad \frac{1}{2}$$

Show your method.

- 5 A factory worker packed 67 boxes of drawing pins in an hour. Each box contained 48 drawing pins.
 a Explain how you would estimate the number of drawing pins that she packed.
 b Would you expect the actual number to be more or less than your estimate? Explain your answer.
 c Calculate the exact number of drawing pins that she packed into the boxes. Show your method.
- 6 Jack saw two identical sweatshirts for sale, one in a shop and one in a market.



The sweatshirt in the shop was on sale at $\frac{2}{3}$ of the marked price.

The sweatshirt in the market was on sale with 20% off the marked price.

Work out which sweatshirt would cost less to buy.

Show all your working.

7 Work these out:

a 5^3 b $\sqrt[3]{8000}$ c $\sqrt{4^3 + 6^2}$ d $\sqrt[3]{-8}$

8 Copy and complete the following table showing equivalent fractions, decimals and percentages.

Fraction	Decimal	Percentage
	0.3	
		65%
$\frac{5}{8}$		
		$33\frac{1}{3}\%$
	0.84	
$\frac{4}{25}$		

9 a Simplify these ratios: i 15:25 ii $\frac{1}{2} : \frac{3}{4}$ iii 2.4:1.6 iv 30 cm:1.5 m

b The audience in a theatre is made up of the following ratio:

men: women: children = 2:4:3

There are 207 people in the audience. Calculate the number of men.

c Copy and complete these equivalent ratios:

i $3:7 = 21:\dots\dots$ ii $18:30 = \dots\dots:5$ iii $2\frac{1}{2}:5\frac{3}{4} = 10:\dots\dots$

10 a Rhian measures the height of one of her tomato plants as 20 cm.

The next week it is 15% taller. What is its new height?

b Another tomato plant grows from 240 cm to 312 cm.

Calculate the percentage change in height.

11 Look at these number cards:



Copy and complete the blank cards below and work out the answers to parts a and b.

a Choose the two cards that give the lowest possible answer.

× =

b Choose two of the cards that give the answer 100.

÷ = 100

12 Use the rules of indices to simplify the following.
Give your answers in index form.

a $4^3 \times 4^5$

b $3^8 \div 3^2$

c $(t^4)^3$

d $\frac{m^9}{m^2 \times m^4}$

13 Sharon is making fairy cakes. She uses 150 g flour to make 24 cakes.
The following week she wants to make 60 fairy cakes.
How much flour will she need?

Y10 Foundation statistics

- 1 Marek decides to conduct a traffic survey. He records the different numbers of people in vehicles passing his school.

He records the following data for 30 vehicles.

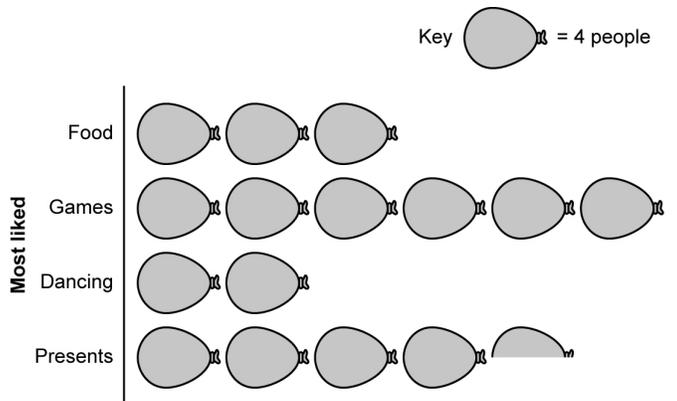
1	3	1	2	1	1
1	4	1	1	1	2
2	1	2	5	3	1
1	3	2	2	1	2
1	1	2	1	1	4

- a Complete a tally chart to show this information.
 b What was the most common number of people in a vehicle?
 c Here are some words that can be used to describe data:

Discrete Continuous Qualitative Quantitative

Select two words from this list that can be used to describe Marek's data.
 Give a reason for each of your choices.

- 2 Gareth asked some of his friends what they liked best about going to a party. He then drew this pictogram to show the results.



- a What was liked best by most people?
 b What was liked best by least people?
 c How many people liked food best?
 d How many people liked presents best?
 e How many more people liked games than liked dancing best?
 f How many people did Gareth ask altogether?

- 3 Eleanor recorded the number of minutes it took for each member of her class to complete a cross-country race.

These are her results:

59.3 68.6 65.1 61.0 62.7 64.3 46.2 54.8 58.0 73.9
 63.8 53.4 56.5 70.2 68.8 55.7 57.1 66.0 74.4 61.4
 61.2 68.5 74.3 52.0 63.7 50.3 62.6 71.9 49.5 58.2

- a Copy and complete the frequency table below:

Time spent (t sec)	Tally	Frequency
$45 \leq t < 50$		
$50 \leq t < 55$		
$55 \leq t < 60$		
$60 \leq t < 65$		
$65 \leq t < 70$		
$70 \leq t < 75$		

- b What fraction of the class took less than one hour to complete the race?
 Give your answer in its simplest form.

- 4 A bag contains the numbered counters shown.



A counter is picked at random from the bag.

- a What is the probability that it is a 1?
 b What is the probability that it is 3 or 4?
 c What is the probability that it is a 5?
- 5 In a biology survey, Ross counts the number of earthworms found in each square metre of soil.

These are his results

7 3 4 9 3 9 3 3 4

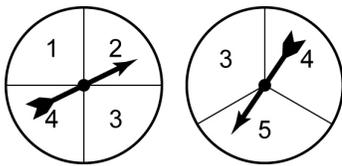
- a What is the mode of this data?
 b Find the median
 c What is the range?
 d What is the mean number of earthworms per square metre?

- 6 In an English lesson, 24 students were asked to write down the first vowel in their name. The table shows the information.

First vowel in a student's name	Number of students
A	8
E	5
I	3
O	6
U	2

Construct a pie chart to show this information. Label your pie chart clearly.

- 7 Sue is playing a game with these spinners. She spins the two spinners and adds together the numbers shown on them.



- a Copy and complete this table to show all of the possible totals.

+	1	2	3	4
3	4			
4				
5			8	

- b Find the probability that Sue will score an odd total.
 c What is the probability of Sue getting a score of at least 8?
- 8 Shelley is doing a survey to find out how many people eat five portions of fruit or vegetables every day. She decides to ask 10 people as they come out of a local gym. Give two different reasons why Shelley's method might not give very good data.
- 9 A bag contains only blue, red and green discs. A disc is picked out of the bag at random. The probability of drawing out a blue disc is $\frac{1}{3}$. The probability of drawing out a green disc is $\frac{1}{4}$. What is the probability of drawing out a red disc?

10 Two groups take the same French test. The test is marked out of 50.
Asif writes down the marks for his group.

26, 48, 50, 32, 39, 25, 20, 23, 39, 26

- a Calculate the mean mark for this group.
 - b What is the range for this group?
- Julia writes down the marks for her group.
The lowest mark is 13. The range is 30.
- c What is the highest mark for Julia's group?
 - d Compare the results of the two groups.

11 A survey was carried out to find out how many children there were in each of the families of a group of students.
The results are shown in the table.

Number of children in each family	Number of families
1	6
2	18
3	13
4	11
5	2

- a What is the modal number of children per family?
- b Find the median number of children per family.
- c Find the mean number of children per family.

12 Twenty people were asked their age and the number of hours sleep they felt they needed.

The results are shown in the table.

Age	11	17	20	28	27	25	17	19	24	19
No. of hours sleep	10.5	9	8.5	6	5	6.5	8.5	8	6	7.5

Age	21	16	20	29	22	16	23	15	22	25
No. of hours sleep	7	10.5	8	5.5	7.5	9.5	7	10	6.5	10

- a** Plot this information on a scatter graph and draw the line of best fit.
 - b** Use your line of best fit to estimate how many hours of sleep a person aged 26 would need.
 - c** Comment on the relationship between age and the number of hours sleep needed.
- 13** A drawing pin is tossed 100 times and lands 'pin up' 72 times.
- a** From this experiment, what is the relative frequency of a drawing pin landing 'pin up'?
 - b** The drawing pin is tossed another 40 times. Approximately how many of these times would you expect it to land 'pin up'? Explain your answer.