Home Learning 1.1 Date Due:.....

1 Write the next two terms in each sequence. Describe the term-to-term rule you have used.

a 3, 7, 11, ... **b** 5, 10, 20, ... **c** 30, 25, 20, ... **d** 2, 4, 8, ... **e** 1, 8, 15, ...

f 7, 9, 11, ... **g** 5, 14, 23, ... **h** 7, 13, 19, ... **i** 13, 26, 39, ...

2 Find at least one sequence between each pair of numbers. Fully describe the term-to-term rule you have used.

a 1, ... 9 **b** 1, ... 16 **c** 5, ... 21 **d** 4, ... 36

e 10, ... 20 **f** 16, ... 8

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Home Learning 1.2 Date Due:.....

In each of the following sequences, find the missing terms and the 50th term.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th	50th
Sequence A	...	...	...	...	14	16	18	20	...
Sequence B	...	9	...	19	...	29	...	39	...
Sequence C	...	...	18	26	...	42	50	...	...
Sequence D	...	...	25	...	47	...	...	80	...
Sequence E	...	11	...	23	...	...	41	...	...

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Home Learning 6.5 Date Due:.....

Solve the following equations.

a $2x = 10$	**b** $x + 4 = 10$	**c** $x - 1 = 9$	**d** $4x = 24$
e $m - 2 = 17$	**f** $m + 4 = 9$	**g** $7m = 63$	**h** $2m - 5 = 7$
i $5k + 1 = 21$	**j** $4k - 3 = 9$	**k** $2k - 1 = 15$	**l** $3k + 5 = 23$
m $6x - 4 = 26$	**n** $3x + 7 = 22$	**p** $4x + 5 = 29$	**q** $8x - 4 = 44$

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Home Learning 6.4 Date Due:.....

1 Write each of these rules as a formula. Use the first letter of each variable in the formula (printed in **bold** type).

a The **c**ost of renting out a hut is £5 per **d**ay.

b The **c**ost of a journey is £2 for every **m**ile travelled.

c The **d**istance is 70 times the number of **h**ours travelled.

d **M**um's age is always **J**oe's age plus 39.

2 An engineer uses the formula $t = 30 + 20k$, where t = time in minutes and k = number of items to be made. Calculate the time for the engineer to make:

a 5 items **b** 3 items **c** 8 items

3 The formula for the cost of a TV advert is $C = 90P + 150T$, where C is the charge in £, P is the number of people used and T is the number of seconds the advert lasts. Use the formula to calculate the charge for the following adverts.

a 3 people, lasting 10 seconds **b** 1 person, lasting 15 seconds

c 8 people, lasting 6 seconds **d** 20 people, lasting 9 seconds

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Home Learning 1.3 Date Due:.....

Find the generalisation (*n*th term) for the number of matchsticks in the following patterns.

Use this generalisation to help find the 50th term in each pattern.

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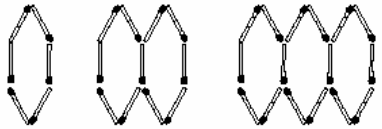
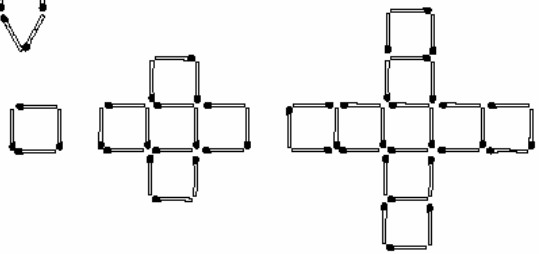


3 **a** Find the generalisation and the 50th term for the number of matchsticks in this pattern.

b Find the generalisation and the 50th term for the number of squares in this pattern.



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Home Learning 1.4 Date Due:.....

1 Draw diagrams to illustrate the following functions.

a multiply by 4 → add 5

b add 5 → multiply by 4

c add 1 → multiply by 3

d multiply by 3 → add 1

2 What do the functions and your diagrams show you about the order in which you combine functions?

3 Write down the inverse functions of:

a multiply by 5 **b** add 6 **c** divide by 2 **d** subtract 7

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Home Learning 6.3 Date Due:.....

1 Simplify each of the following expressions.

a $3x + 4y + 2x + 5y$ **b** $4w + 5t - 3w - t$ **c** $5m + 6n + 2m - n$

d $2x + 7y - y - x$ **e** $9 + 5x - 3 + 7x$ **f** $7p + 8 - 2p - 5$

g $y + 3x - 7 + 2x - y$ **h** $6d + 7c - 4c + 6$ **i** $5f + 9 + 2d - 7 - f$

2 Expand each of the following.

a $3(x + 4)$ **b** $2(2t + 5)$ **c** $4(2m + 3)$ **d** $5(w - 1)$ **e** $5(2m - 3)$

f $6(3q - 2)$ **g** $3(2x - 5)$ **h** $5(t + 6)$ **i** $6(4b + 3)$ **j** $3(4x - 1)$

k $8(2t - 3)$ **l** $4(5t - 1)$

3 Expand and simplify each of the following expressions.

a $3(x + 4) + 2(x + 5)$ **b** $3(p + 5) + 4(p + 7)$ **c** $4(w + 5) + 3(w - 1)$

d $4(d - 1) + 5(d + 6)$ **e** $2(7p + 3) + 4(3p + 2)$ **f** $2(5m + 4) + 4(6m - 1)$

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Home Learning 2.1 Date Due:.....

1 Without using a calculator, write down the answers to:

a 57×100 **b** $32 \div 1000$ **c** 1.9×10 **d** $1.3 \div 10$

e $0.2 \div 100$ **f** 2.37×1000 **g** $2.37 \div 10$ **h** 6.09×10

2 Fill in the missing operation in each case.

a 0.77 → ☐ → 77 **b** 345 → ☐ → 34.5

c 6.23 → ☐ → 623 **d** 400 → ☐ → 0.4

3 Find the missing number in each case.

a $6 \times 10 = \square$ **b** $6 \times \square = 600$ **c** $6 \div 10 = \square$

d $6 \div \square = 0.06$ **e** $0.6 \times 10 = \square$ **f** $0.6 \times \square = 600$

g $0.6 \div 10 = \square$ **h** $0.6 \div \square = 0.006$ **i** $\square \div 100 = 0.06$

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Home Learning 2.2 Date Due:.....

1 Using a table with place-value headings, fill in the following numbers. Then use your table to write the numbers in order from smallest to largest.

0.65, 0.7, 0.56, 0.602, 0.622, 0.6, 0.08

2 Write each of the following sets of numbers in order from smallest to largest.

a 2.05, 1.9, 2.1, 2.23, 1.999 **b** 0.056, 0.05, 0.062, 0.502, 0.06

3 Write each of the following lengths in order: 2 cm, 0.05 m, 342 cm, 1.23 m, 0.97 m.

4 Write the following amounts of money in order: 20p £1.32 £0.76 £0.16 54p.

5 Put the correct sign, > or <, between each pair of numbers.

a 0.045 ☐ 0.04 **b** 1.32 ☐ 1.4 **c** 8p ☐ £0.12

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Home Learning 6.2 Date Due:.....

1 In each of the following lists, write down all the expressions that equal each other.

a $6+7,\ 7\times 6,\ 7-6,\ 6\times 7,\ 7\div 6,\ 6-7,\ 7+6,\ 6\div 7$

b $xy,\ x+y,\ y-x,\ yx,\ \frac{x}{y},\ x-y,\ \frac{y}{x},\ y+x,\ x\times y$

2 Write down two more facts that are implied by each of the following statements.

a $4+7=11$ **b** $d+f=8$ **c** $4\times 5=20$ **d** $xy=18$

3 Show by substitution of suitable numbers that:

a $m+n+p=p+n+m$ **b** $abc=cba$ **c** $t-m\neq m-t$

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Home Learning 6.1 Date Due:.....

1 Write down the values of each expression for the three values of n.

a $2n + 3$ where **i** $n = 3$ **ii** $n = 4$ **iii** $n = 5$

b $4n - 1$ where **i** $n = 5$ **ii** $n = 6$ **iii** $n = 7$

c $10 - 2n$ where **i** $n = 4$ **ii** $n = 3$ **iii** $n = 1$

2 Write down the values of each expression for the three values of n.

a $n^2 - 3$ where **i** $n = 2$ **ii** $n = 3$ **iii** $n = 4$

b $n^2 + 4$ where **i** $n = 5$ **ii** $n = 6$ **iii** $n = 7$

c $2 + n^2$ where **i** $n = 8$ **ii** $n = 9$ **iii** $n = 10$

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Home Learning 2.3 Date Due:.....

1 Work out:

a $-4 + 5 - 7$ **b** $+7 - 2 - 8$ **c** $-2 - -3 + -5$

d $-4 - -5 - +6$ **e** $-2 + 7 + 2$ **f** $- +6 + -8 - -6$

2 Find each missing number.

a $+6 - \square = -2$ **b** $\square - -3 = -6$ **c** $+8 + \square = 2$ **d** $\square + \square = 0$

3 Complete this magic square.

–6		
+2		–8
–5		

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Home Learning 2.4 Date Due:.....

1 Explain why these calculations must be wrong.

a $63 \times 36 = 2286$ **b** $63 \times 36 = 3268$ **c** $714 - 68 = 654$

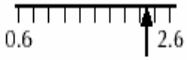
2 Estimate answers to these calculations.

a 21.6×38.4 **b** $184 \div 29$ **c** $\frac{52.3 + 39.6}{18.6 - 5.4}$ **d** $\frac{49.3 + 61.7}{26.5}$

3 Estimate the number the arrow is pointing to.

a

b

c 

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Home Learning 5.5 Date Due:.....

1 The frequency table shows the results of throwing a dice 30 times.

Score	1	2	3	4	5	6
Frequency	10	6	4	3	5	2

a Calculate the *experimental* probability for each score.

b Comment on whether you think the dice is a fair one.

2 Pauline throws two fair coins 40 times. Her results are shown in the following frequency table.

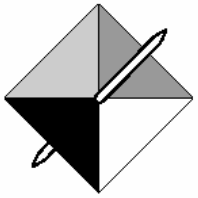
Outcome	2 Heads	2 Tails	1 Head and 1 Tail
Frequency	10	12	18

a Calculate the *experimental* probability of getting **i** 2 Heads **ii** 2 Tails **iii** 1 Head and 1 Tail

b What do you think is the theoretical probability of getting 1 Head and 1 Tail when throwing two coins?

3 A biased spinner has four coloured sections.

Douglas wants to find the experimental probability of getting each colour.
He spins it 100 times and records his results in a frequency table.



Colour	blue	red	green	yellow
Frequency	30	40	10	

a Copy and complete the frequency table.

b Calculate the experimental probability for each colour.

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Home Learning 5.4 Date Due:.....

All answers should be given as fractions.

1 A card is chosen at random from a set of cards numbered from 1 to 20. Find the probability of choosing a card that is:

a an even number **b** a number containing a 5

c a two-digit number **d** a number less than six

2 Ella is playing a game using this fair five-sided spinner. What is the probability that she scores:

a 7 **b** 1 or 9 **c** an odd number **d** an even number?

3 A letter is chosen at random from the word

M	A	T	H	E	M	A	T	I	C	S

Find the probability that the letter chosen is:

a M **b** E **c** a vowel **d** a consonant

4 A set of snooker balls consists of 15 red balls and one of each of black, blue, brown, green, pink, white and yellow. If a ball is chosen at random, find

a P(choosing a red ball) **b** P(choosing a yellow ball)

c P(choosing a blue or green ball) **d** P(choosing a black or a red ball)

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Home Learning 2.5 Date Due:.....

1 By means of a drawing, show how you would use a number line to work out the following.

a 4.8 + 5.6 **b** 7.3 – 3.9

2 Using column methods, work out the following. Show all your working clearly.

a 43.2 + 16.7 **b** 6.79 + 5.4 **c** 302.3 + 7.92 + 0.9

3 Using column methods, work out the following. Show all your working clearly.

a 43.2 – 16.7 **b** 6.79 – 5.4 **c** 302.3 – 7.92 – 0.9

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Home Learning 3.1 Date Due:............................

1 Draw straight lines with the following measurements.

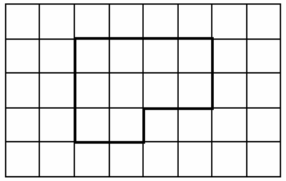
a 4 cm **b** 5.5 cm **c** 6.4 cm **d** 8.8 cm

2 Draw rectangles with the following perimeters.

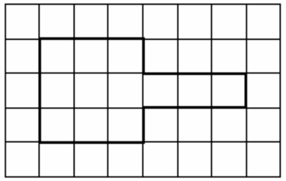
a 10 cm **b** 16 cm **c** 24 cm

3 Find the perimeter and area of each of the following shapes. Each square on the grid represents one square centimetre.

a

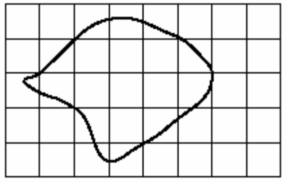


b

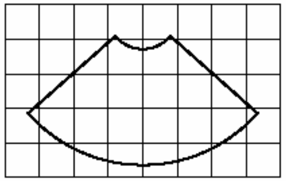


4 Estimate the area of each of the following shapes. Each square represents one square centimetre.

a



b



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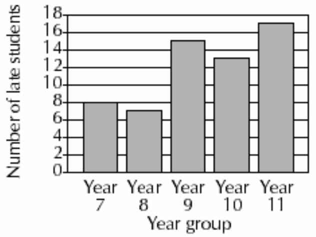
Home Learning 5.3 Date Due:............................

1 The bar chart shows the number of students who were late for school in each year group on a particular day.

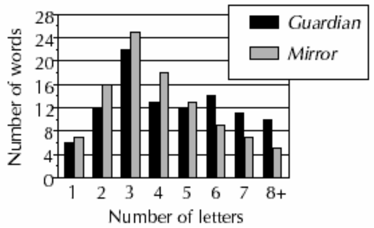


a How many students were late in Year 10?

b How many students were late altogether?

c What percentage of students were late if there are 1000 pupils at the school?

2 The dual bar chart shows the lengths of 100 words in two different newspaper passages.



a What is the modal word length for each newspaper?

b How many words have more than six letters in **i** *Guardian* **ii** *Mirror*?

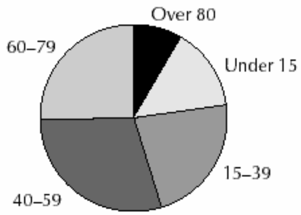
c Compare the length of words for the two newspapers.

3 The pie chart shows the ages of people in a village.

a What is the modal class for the ages of the people?

b Approximately how many people are aged between 60 and 79, if there are 600 people in the village?

c Would you expect the proportions of age groups to be similar if a pie chart were drawn for the people in a city? Explain your answer.



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Home Learning 3.2 Date Due:.....

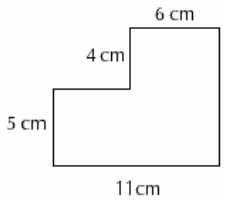
1 A room is to be fitted with a carpet. The room measures 12 m by 10 m.

a Calculate the area of the room.

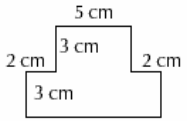
b The carpet costs £8 for 1 m^2. How much will it cost to carpet the room?

2 Find **i** the perimeter and **ii** the area of each of these compound shapes.

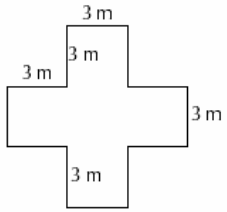
a



b



c



3 Four squares, each of side 4 cm, are to be cut from a piece of card measuring 15 cm by 10 cm. Calculate the area of the remaining card.

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Home Learning 5.2 Date Due:.....

1 Find the mean of each set of data.

a 4, 3, 0, 1, 4, 3, 2, 0, 1

b 21, 20, 25, 19, 17, 24

c 37, 42, 35, 40, 36, 45, 38

2 Find the mean of each set of data, giving your answer to one decimal place.

a 12, 14, 11, 10, 12, 15

b 89, 92, 78, 102, 88, 76, 101

c 7.6, 5.8, 7.4, 8.1, 6.3, 6.7, 9.2, 8.5, 7.1

3 Terry receives £4.00 pocket money per week. He decides to ask eight of his friends how much pocket money they receive each week. He writes down their amounts on paper.

Abi	£3.50	Eli	£6.00
Ben	£5.00	Fred	£4.50
Carol	£3.50	Gail	£3.50
Dave	£10.00	Harry	£8.00

a Find the median amount for the friends.

b Find the modal amount for the friends.

c Find the mean amount for the friends.

d Which average should Terry use to convince his parents that he should have a rise in his pocket money? Explain your answer.

4 Barbara records her marks in a series of Spelling Tests in her school diary.

7 5 6 [redacted] 9 8 7 6 6 7

Unfortunately she cannot read the mark for the fourth test, because she smudged the mark as she wrote it down. She knows that her mean mark for the tests was 7. Find the mark covered by the smudge.

5 Sue is doing a traffic survey on the number of occupants in cars in a morning on a busy road.

Her results are shown in a frequency table.

No. of occupants	Frequency	No. × Frequency
1	13	
2	9	
3	4	
4	3	
5	1	

a Copy and complete the table.

b Find the mean for the number of occupants.

6 Phil has five cards with numbers on. The median of the numbers is 7, the mean of the numbers is 6 and the range of the numbers is 9. What are the missing numbers on the three cards.

1	3	?	?	?

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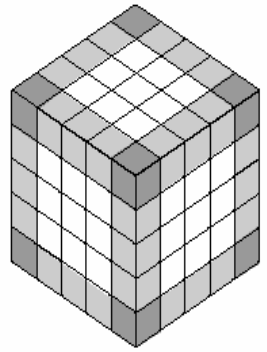
Home Learning 3.4 Date Due:.....

1 Find the surface area of a cuboid with $l = 20$ cm, $w = 8$ cm, $h = 3$ cm.

2 A cube has a surface area of 294 cm^2. Find the length of an edge of the cube.

3 The squares on the outside of a cube with edge length 5 cm are painted dark grey, light grey and white, as shown on the diagram on the right.



a How many squares are coloured dark grey?

b How many squares are coloured light grey?

c How many squares are coloured white?

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Home Learning 4.1 Date Due:.....

1 Find the missing number in each of these equivalent fractions.

a $\frac{5}{6} = \frac{\square}{36}$ **b** $\frac{7}{8} = \frac{\square}{40}$ **c** $\frac{2}{9} = \frac{\square}{36}$ **d** $\frac{3}{7} = \frac{12}{\square}$

2 Cancel each of these fractions to their lowest terms.

a $\frac{3}{12}$ **b** $\frac{5}{35}$ **c** $\frac{12}{28}$ **d** $\frac{15}{45}$ **e** $\frac{18}{24}$ **f** $\frac{5}{30}$ **g** $\frac{24}{54}$ **h** $\frac{35}{15}$

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Home Learning 5.1 Date Due:.....

1 Find the mode, median and range of each of the following sets of data.

a 11, 12, 13, 12, 14, 11, 12 **b** 66, 72, 78, 75, 78, 68, 63 **c** 1, 0, 1, 0, 1, 0, 1, 0, 1, 1

d 21, 24, 26, 29, 34, 32, 27, 25, 24, 19

2 David is taking part in a fishing competition. At the end of the competition, the weight of each fish in his keep net is as follows: 300 g, 450 g, 620 g, 300 g, 550 g, 300 g, 410 g.

a Find the modal weight of the fish. **b** Find the median weight of the fish.

c Find the range for the weight of the fish.

3 Given below are the age, height and weight of each of seven girls in a netball team.

	Anna	Claire	Chloe	Beth	Lauren	Martha	Sarah
Age (yr)	14	16	13	12	12	16	15
Height (cm)	160	164	161	157	153	167	168
Weight (kg)	40	41	36	31	34	41	39

a Find the median age of the team. Which girl has the median age?

b Find the median height of the team. Which girl has the median height?

c Find the median weight of the team. Which girl has the median weight?

d Who would you choose as the average player in the team? Give a reason for your answer.

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Mark: .....

Home Learning 4.5 Date Due:.....

1 What number is halfway between each of these pairs? **a** $\frac{1}{20}$ and $\frac{7}{10}$ **b** $\frac{1}{4}$ and $1\frac{1}{8}$

2 Which of these is the greater? **a** $\frac{2}{5}$ of 35 or $\frac{3}{4}$ of 20 **b** $\frac{3}{11}$ of 108 or $\frac{3}{5}$ of 70

3 Which of these shops is giving the better value?

Derek's Fashions: Armani suits reduced by $\frac{1}{5}$ from £650

Mary's Modes: Armani suits reduced by $\frac{1}{4}$ from £680

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Mark: .....

Home Learning 4.2 Date Due:.....

1 Convert each of the following decimals to a fraction.

a 0.3 **b** 0.12 **c** 0.38 **d** 0.75 **e** 0.85

2 Convert each of the following fractions to a decimal.

a $\frac{4}{5}$ **b** $\frac{7}{10}$ **c** $\frac{11}{25}$ **d** $\frac{11}{20}$ **e** $\frac{1}{11}$

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Mark: .....

Home Learning 4.3 Date Due:.....

1 Work out each of these. Convert to mixed numbers or cancel down to lowest terms if necessary.

a $1\frac{1}{4}+\frac{1}{2}$ **b** $\frac{1}{8}+1\frac{1}{4}$ **c** $\frac{5}{7}+\frac{7}{7}$ **d** $1\frac{1}{4}-\frac{7}{8}$ **e** $2\frac{1}{8}-1\frac{1}{2}$

f $\frac{17}{20}-\frac{7}{20}$ **g** $2\times\frac{4}{5}$ **h** $3\times\frac{7}{15}$ **i** $\frac{3}{8}+\frac{1}{2}-\frac{3}{4}$ **j** $4\times\frac{7}{8}$

2 Work out each of these.

a $\frac{2}{3}$ of 21 cm **b** $\frac{1}{5}$ of £120 **c** $\frac{4}{7}$ of 28 kg.

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Mark: .....

Home Learning 4.4 Date Due:.....

1 Work out the equivalent percentage and fraction to each of the following decimals.

a 0.5 **b** 0.6 **c** 0.95 **d** 0.84 **e** 0.38

2 Work out the equivalent decimal and fraction to each of the following percentages.

a 45% **b** 90% **c** 32% **d** 19% **e** 6%

3 Work out the equivalent percentage and decimal to each of the following fractions.

a $\frac{9}{25}$ **b** $\frac{13}{50}$ **c** $\frac{3}{10}$ **d** $\frac{13}{20}$ **e** $\frac{5}{8}$

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Mark: .....