Name	
Form	
Teacher	

Maths
Homework Booklet
Year 7e Autumn

Title	Hand in date	Score achieved
Number Patterns - 2		
Substitute numbers into formulae, equations and expressions		
Simplify and manipulate algebraic expressions by collecting like terms		
Use algebraic methods to solve linear equations in one variable		
Rounding - Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000		
Sequences		
Algebraic notation		
Equality and equivalence		
Place value		
Fraction, decimal and percentage (FDP)		
Mixed A		
Mixed B		
Mixed C		
Mixed D		
Mixed E		
Mixed F		
Mixed G		

9 Number patterns – 2

Write down the next two numbers in each sequence:

1 2, 4, 6, 8, 10 — 1 ..... ☐

2 7, 9, 11, 13, 15, 17 — 2 ..... ☐

3 6, 12, 18, 24, 30 — 3 ..... ☐

4 30, 27, 24, 21, 18, 15 — 4 ..... ☐

5 1, 2, 4, 8, 16, 32, 64 — 5 ..... ☐

6 1, 1, 2, 3, 5, 8, 13 — 6 ..... ☐

7 $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$ — 7 ..... ☐

8 $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}$ — 8 ..... ☐

What are the missing numbers in each sequence?

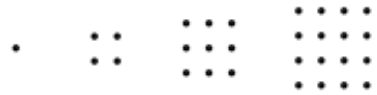
9 5, 8, 11, ..., 17, ..., 23, 26 — 9 ..... ☐

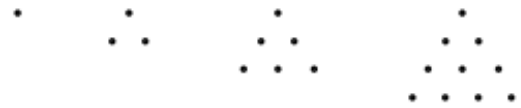
10 20, 18, 16, ..., 12, ..., 8, 6 — 10 ..... ☐

11 1, 10, 100, ..., ..., 100 000, 1 000 000 — 11 ..... ☐

12 40, 36, 32, ..., 24, ..., 16, 12 — 12 ..... ☐

Draw the next pattern in each sequence:

13  — 13 ..... ☐

14  — 14 ..... ☐

15  — 15 ..... ☐

16  — 16 ..... ☐

Substitute numbers into formulae, equations and expressions

1 Work out the value of each of these expressions when $x = 3$.

a $x + 4 =$

b $5x =$

c $x - 10 =$

d $2x - 9 =$

e $7 + x =$

f $11 - 5x =$

g $x^2 =$

h $2x^2 =$

2 Work out the value of each of these expressions when $p = 5$ and $q = 2$.

a $p + q$ .....

b $p - q$ .....

c $q - p$ .....

d $2p + 3q$ .....

e $5p - 4p$ .....

f $6 - q - p$ .....

g $3q - p$ .....

h $p^2 + q^2$ .....

i $3q^2$ .....

j $10 - q^3$ .....

3 Work out the value of each of these expressions when $x = 4$ and $y = 3$ and $z = 1$.

a xy .....

b yz .....

c $2xyz$ .....

d $2xy + 3yz$ .....

e $5xy - yz$ .....

f $x^2 + y^2 + z^2$ .....

g $4xy^2$ .....

h z^3 .....

Simplify and manipulate algebraic expressions by collecting like terms

1 Simplify

a $a + a + a + a$ .....

b $3b + 2b$ .....

c $c + 2c + 3c$ .....

d $4d + 2d + d + 3d$ .....

e $5e - 3e$ .....

f $3f - f$ .....

g $7g + 3g - 8g$ .....

h $2hk + 8hk - 3hk$ .....

i $3m^2 + m^2$ .....

j $9n^2 - 2n^2 - n^2$ .....

2 Simplify

a $4p + 2p + 5q + q$ .....

.....

b $3r + 4r + 7s - 2s$ .....

.....

c $t + u + t + 3u$ .....

.....

d $9v + 3w - 5v - 2w$ .....

.....

e $x + 4y + 3x - 2y$ .....

.....

f $3a - 9b - a + 5b$ .....

.....

g $2c - 3d + 8c - 5d$ .....

.....

h $e + 3f - 3e + 2f + 1$ .....

.....

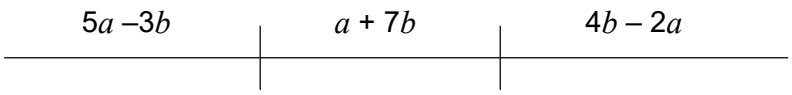
i $2g - h + 4 - 3g + 7h - 5$ .....

.....

j $9j + k - 2m - 5j + 7 - 3m$ .....

.....

3 The diagram shows a line made from three sections.
The length of each section is given in centimetres.



Write down an expression, in terms of a and b, for the total length of this line.

.....

.

.....

.

Use algebraic methods to solve linear equations in one variable, for equations in the forms $x + a = b$, $nx = b$ and $\frac{x}{n} = b$, where n can be a fraction

1 Solve these equations. Show your working.

a $s + 3 = 7$ .....

.....

.....

b $t - 6 = 6$ .....

.....

.....

c $r - 12 = 9$ .....

.....

.....

d $3 + d = 9$ .....

.....

.....

e $24 = p + 12$ .....

.....

.....

f $12 = p + 24$ .....

.....

.....

2 Solve these equations. Show your working.

a $w + 5 = 9$ .....

.....

.....

b $4t = 12$ .....

.....

.....

c $u - 10 = 35$ .....

.....

.....

d $\frac{h}{3} = 7$ .....

.....

.....

e $14 = f - 6$ .....

.....

.....

f $q + 9 = 12$ .....

.....

.....

g $32 = 8n$ .....

.....

.....

h $3 = t \div 10$ .....

.....

.....

i $3g = 0$ .....

.....

.....

j $p - 5 = 0$ .....

.....

.....

Rounding - Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000

1 Round these numbers to the nearest 10.

a 58 ..... b 22 ..... c 79 ..... d 35 .....

e 7 ..... f 234 ..... g 359 ..... h 762 .....

i 293 ..... j 307 ..... k 1003 ..... l 3204 .....

m 2995 ..... n 555 .....

2 Round these numbers to the nearest 100.

a 204 ..... b 390 ..... c 83 ..... d 5430 .....

e 445 ..... f 649 ..... g 12 381 .....

h 53 807 ..... i 100 093 ..... j 230 988 .....

3 Round these numbers to the nearest 1000.

a 5500 ..... b 842 ..... c 3200 .....

d 6455 ..... e 9786 ..... f 24 488 .....

g 25698 ..... h 75699 ..... i 2480 .....

4 Round the number 4117 to the nearest hundred.

.....

5 Round the number 75695 to the nearest thousand.

.....

Year 7
Sequences

Name _____

1 Here are the first three terms in a sequence.

Draw the next term in the sequence.

☐ 1 mark

How many circles will make up the 5th term?

_____

☐ 1 mark

2 Find the next two terms in each of the linear sequences.

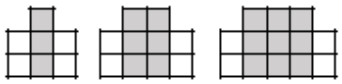
51, 47, 43, _____, _____

1500, 2600, 3700, _____, _____

7.25, 7.45, 7.65, _____, _____,

☐ 3 marks

3



How many grey squares would there be in the 4th term of this sequence?

_____

☐ 1 mark

How many white squares would there be in the 19th term of the sequence?

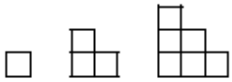
_____

☐ 1 mark

4 Tick the sequence that is linear.

1, 4, 16, 64, 256 ☐

8.3, 6.3, 4.3, 2.3, 0.3 ☐

 ☐

☐ 1 mark

5 Create two **different** linear sequences that both start with the number 65

65, _____, _____, _____

65, _____, _____, _____

☐ 2 marks

6 Find the next two terms in these geometric sequences.

5, 10, 20, _____, _____

9000, 900, 90, _____, _____

☐ 2 marks

7 This pattern repeats every three terms as shown.

What will be the 9th term in the pattern?

_____

☐ 1 mark

What will be the 31st term in the pattern?

_____

☐ 1 mark

8 Complete the table to represent the sequence.

Term	1	2	3	4
Number of circles				

☐ 1 mark

Would the points of the graph of this sequence lie on a straight line? Explain your answer.

☐ 1 mark

9 (H) Find the missing terms in these linear sequences.

3, _____, 9

_____, 3, _____, _____, 9

☐ 2 marks

10 (H) Find the next two terms in this sequence.

3, 6, 10, 15, _____, _____

☐ 1 mark

11 (H) These numbers make up two linear sequences.

1	3	4	5	7	7	10	13

What are the two linear sequences?

1st _____, _____, _____, _____

2nd _____, _____, _____, _____

☐ 1 mark

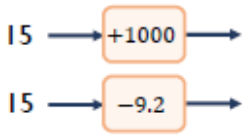
Total marks ☐

Year 7

Algebraic Notation

Name _____

1 Find the output in each of these function machines when the input is 15

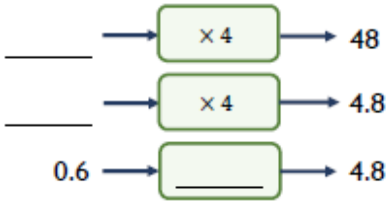


_____

_____

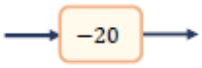
2 marks

2 Find the missing numbers for each of these function machines.



3 marks

3 What is the **inverse** function of this machine?



_____

1 mark

4 Simplify these expressions.

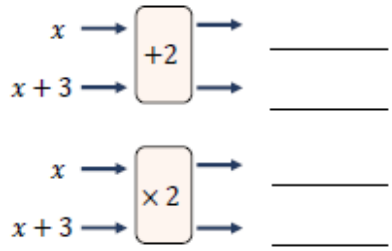
$3 \times b$ _____

$b + b + b$ _____

$b \div 3$ _____

1 mark

5 Write expressions to show each output.



_____

_____

_____

_____

2 marks

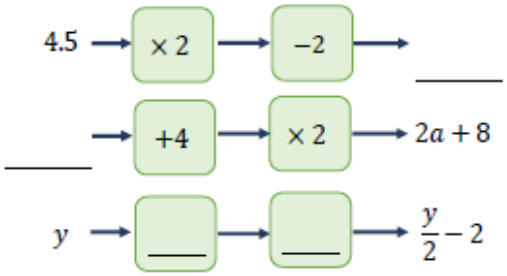
6 Circle the expression that will have the largest value when $a = 4$

$8 - a$ $\quad$ $a - 8$

$\frac{8}{a}$ $\quad$ $\frac{a}{8}$

1 mark

7 Complete the missing values.



_____

_____

3 marks

8 $x = 9$ and $y = 1$

Work out the value of the expression $\frac{x - y}{2}$

_____

1 mark

If the value of y increases, what will happen to the value of the expression?

1 mark

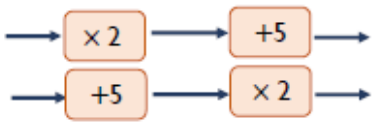
9 Tick the equations that are straight line graphs.

$y = 6 - x$ ☐ $\quad$ $y = 5 + x^2$ ☐

$y = 3 + \frac{x}{2}$ ☐ $\quad$ $y = 2x + 3$ ☐

1 mark

10 Mia says that given the same input, both function machines will always have the same output.



Give an example show Mia is **wrong**.

1 mark

11 Find the first three terms of these sequences.

H

$5 + n$ _____, _____, _____

$5 + 2n$ _____, _____, _____

2 marks

Describe a difference between the two sequences.

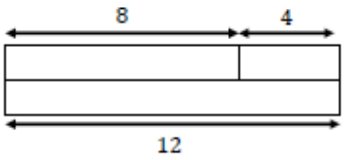
1 mark

Total marks ☐

Year 7
Equality and Equivalence

Name _____

1 Complete the fact family for this bar model.



$8 + 4 = 12$ _____

_____ _____

2 marks

2 Complete the fact family for this bar model.

28			
7	7	7	7

$4 \times 7 = 28$ _____

_____ _____

2 marks

3 Solve these equations.

$a + 37 = 83$

$a =$ _____ 1 mark

$24 = b - 7.6$

$b =$ _____ 1 mark

$\frac{c}{9} = 40$

$c =$ _____ 1 mark

$60 = 5d$

$d =$ _____ 1 mark

4 Make up an equation which has solution $x = 7$

1 mark

5 Sam thinks of a number.
She subtracts 87 from his number and gets the answer 254
Show this information as an equation.

1 mark

Solve the equation to find Sam's number.

1 mark

6 Sort the following into two sets of like terms.

$5x$	-5	x	5	$2x$	$-5x$

Set 1	Set 2

2 marks

7 Tick the expressions that are equivalent to $5b$.

$5 + b$	$3b + 2b$	$6b - b$
$5 \times b$	$b + b + b + b + b$	$b \div 5$

2 marks

8 Simplify these expressions by collecting like terms.

$4x + 3x - 2x$ _____

$5c + 3d + 2d + 8d$ _____

$8t + 2t^2 - 3t + 2t^2$ _____

3 marks

9 An expression has four terms.
When simplified, the expression becomes $6x + 3$
What might the expression be?

1 mark

10 Tim says that the following expressions are equivalent to each other.

$2n + 5$	$5 + 2n$

Is Tim correct? Explain your answer.

1 mark

Total marks

Year 7

Place Value

Name _____

1 Write down a five-digit whole number that has a 4 in the thousands place and 7 in the tens place.

_____ 1 mark

Write down the number that is 10,000 more than 9 million.

_____ 1 mark

2 Complete the statements using <, > or =

2.5 million ◯ 250 000

0.351 ◯ 0.36

6 hundredths ◯ $\frac{6}{10}$

3 marks

3 The ages of four children are 14, 12, 15, and 17
Work out the range of the ages of the four children.

_____ 1 mark

Work out the median of the ages of the four children.

_____ 1 mark

4 Kai represents a number using place value counters.

What number does Kai represent?

_____ 1 mark

Kai says his number rounded to the nearest whole number is 35

Is Kai correct? Give a reason for your answer.

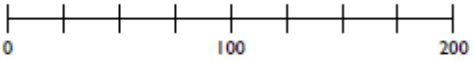
1 mark

Round Kai's number to one significant figure.

_____ 1 mark

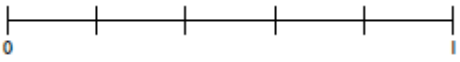
5 Draw arrows to the number line to show the position of each of these numbers.

150 75



2 marks

Draw an arrow onto this number line to show the approximate position of 0.35



1 mark

6 Write down the value of the 5 in each of these numbers.

8.154 _____

751 602 _____

1 567 324 896 _____

3 marks

7 Here are five number cards.

5	8	?	3	3

- The **median** of the numbers is 5
- The **range** of the numbers is 5
- There is one missing number.

Write down **one** possible value of the missing number.

_____ 1 mark

Explain why the missing number **couldn't** be 9

1 mark

8 (H) Fay thinks that one billion is the same as $10^2 \times 10^7$
Joe thinks that one billion is the same a $10^3 \times 10^6$

Explain why they are both **correct**.

1 mark

Put these numbers in ascending order

7×10^2 2×10^7 7×10^{-2} 2×10^{-7}

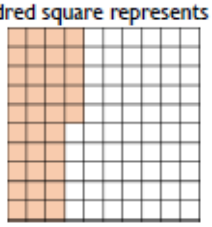
_____ 1 mark

Total marks ____

Year 7
FDP

Name _____

1 This hundred square represents one whole.



What percentage is shaded? _____

What fraction is **not** shaded? _____

2 marks

2 Complete the statements using <, > or =

2% ◯ 0.2

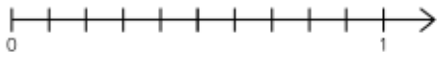
$\frac{4}{10}$ ◯ 0.36

25% ◯ $\frac{1}{4}$

3 marks

3 Draw lines to show where the numbers would lie on the number line.

$\frac{7}{10}$ 0.15 $\frac{38}{100}$



3 marks

4 One quarter of this pie chart is blue.
15% is orange.

What **percentage** is blue or orange?

_____

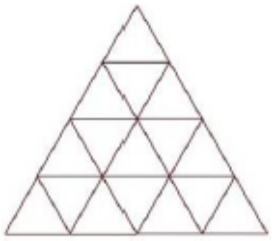
1 mark

The other two sections are equal in size.
What percentage of the whole chart is yellow?

_____

1 mark

5 Each of the small triangles in the diagram is equal in size.
Shade $\frac{3}{8}$ of the diagram.



1 mark

6 Complete the boxes so the fractions are all **equivalent**.

$$\frac{3}{5} = \frac{\square}{10} = \frac{33}{\square}$$

2 marks

7 Circle the **largest** fraction.

$\frac{3}{4}$ $\frac{5}{6}$

Explain how you chose your answer.

1 mark

8 Here are some number cards.

28 ÷ 100

Tick the cards that have the same value as the calculation above.

$\frac{14}{50}$ $\frac{7}{25}$ 0.28 14 ÷ 50

2 marks

9 (H) Put these numbers in order of size, starting with the smallest.

$\frac{3}{8}$ $\frac{37}{1000}$ $\frac{2}{5}$ $\frac{1}{4}$ $\frac{19}{100}$

_____

2 marks

10 (H) The sequence below is linear.
Work out the next two terms, giving your answers as fractions, decimals or percentages.

0.6 75% $\frac{9}{10}$ _____ _____

2 marks

Total marks ☐

Mixed A

1. Multiply fifteen by ten.		11. Divide ninety by three.	
2. What temperature is 10 degrees less than 6 degrees Celsius?		12. 7 x 10 = 82 - ?	
3. Write down the next two numbers. 3 , 6 , 9 ...		13. Subtract twenty-one from one hundred.	
4. What is one-fifth of twenty-five?		14. What must be added to eighty-three to make one hundred?	
5. What is three times three added to four times four?		15. One orange costs nineteen pence. How much will three oranges cost?	
6. What are the next two numbers? 3 , 7 , 11, 15 …		16. Five times a number is two hundred. What is the number?	
7. What is the square root of sixty-four?		17. 20 + ☐ =100 ÷ 4	
8. Two factors of 24 add up to 11. What are they?		18. (5 x 6) + (4 x 2)=	
9. How many metres are there in four and a half kilometres?		19. Divide forty-eight by eight	
10. Which is the smallest number. 2.07 2.7 2.4 2 2.04		20. What is thirty-one multiplied by seven?	

Mixed B

1. Multiply twenty two by ten.		11. Divide 120 by 3.	
2. Write two hundred and thirteen to the nearest ten.		12. 7 x 6 = 30 + ?	
3. What temperature is 6 degrees less than 4 degrees Celsius?		13. Subtract thirty-two from sixty-five.	
4. Write down the next two numbers. 22 , 27 , 32 ...		14. What must be added to eighty-three to make one hundred?	
5. What is one-third of twenty-four?		15. One orange costs sixteen pence. How much will four oranges cost?	
6. What are the next two numbers? 26 , 20 , 14 , 8 , …		16. 14 + ☐ = 80 ÷ 4	
7. What is seven squared?		17. (16 ÷ 4) x (7 – 4)=	
8. Two factors of 28 add up to 9. What are they?		18. What is 42 divided by 6 ?	
9. Which is the smallest number. 13 0.13 1.03 0.103 1.3		19. What number is half-way between thirteen and thirty-one?	
10. What is 3.4 multiplied by 100?		20. The coordinates of a square are (7,2), (7,7), (2,7) and (?,?)	

Mixed C

1. What is one thousand minus one hundred and one?		11. Divide 120 by 4.	
2. What temperature is 6 degrees less than 2 degrees Celsius?		12. 9 x 6 = 30 + ?	
3. Write down the next two numbers. 2 , 3 , 5 , 8 , 12 ...		13. Subtract twenty-four from sixty-five.	
4. What is one-fifth of thirty-five?		14. What must be added to seventy-six to make one hundred?	
5. What is the product of 6 and 8?		15. One orange costs fifteen pence. How much will three oranges cost?	
6. What are the next two numbers? 0.3 , 0.7 , 1.1 , 1.5 …		16. 24 + ☐ = 120 ÷ 3	
7. Two factors of 30 add up to 9. What are they?		17. (28 ÷ 4) x (7 – 2)=	
8. Multiply 5.7 by 100.		18. What is 5.6 divided by 8 ?	
9. Which numbers are greater than 0.7 ? 0.37 0.9 0.08 0.69 0.71		19. What number is half-way between fifteen and thirty-seven?	
10. What is five tenths added to three tenths?		20. The coordinates of a square are (1,8), (7,8), (7,2) and (?,?)	

Mixed D

1. What is one thousand subtract three hundred and fifty?		11. Divide 150 by 3.	
2. What temperature is 5 degrees less than 4 degrees Celsius?		12. 7 x 5 = 80 - ?	
3. Write down the next two numbers. 31 , 26 , 21 ...		13. Subtract seventy-eight from one hundred.	
4. What is one-quarter of twenty?		14. How many minutes are there in two hours?	
5. What is five times three added to two times four?		15. What is the total of 162 and 253 ?	
6. What are the missing numbers? ? , 3.2 , 2.4 , ? , 0.8		16. $\square$ – 10 = 90 ÷ 3	
7. What is 12 squared?		17. (6 x 3) + (? – 1) = 26	
8. Divide 57 by 100.		18. What is the product of 0.9 and 6 ?	
9. Which numbers are greater than 0.6 ? 0.39 0.07 0.8 0.69 0.17		19. What number is half-way between 12 and 34?	
10. What is ⅓ added to ⅚?		20. The coordinates of a square are (3,3), (3,9), (9,9) and (?,?)	

Mixed E

1. Divide six hundred and eighty by ten.		11. Divide 180 by 6.	
2. What temperature is 6 degrees more than -2 degrees Celsius?		12. $\square$ x 6 = 60 - 36	
3. Write down the next two numbers. 42 , 45 , 48 ...., ...		13. Subtract thirty-four from seventy-one.	
4. What is one-sixth of forty-two?		14. What must be added to fifty-six to make one hundred?	
5. What is five times four added to six times three?		15. One orange costs twenty-three pence. How much will four oranges cost?	
6. What are the next two numbers? 0.06 , 0.12 , 0.18 …		16. $\square$ – 15 = 75 ÷ 3	
7. What is the square root of eighty-one?		17. (36 ÷ 6) + (4 x 3)=	
8. Which is the smallest number. 0.5 0.17 0.07 1.7 0.071		18. Divide thirty-two by eight	
9. What is one-quarter added to three eighths?		19. What number is half-way between twenty-one and fifty-three?	
10. 8 biscuits cost 24p altogether. How much do 5 biscuits cost?		20. The coordinates of a square are (0,6), (0,0), (6,0) and (?,?)	

Mixed F

1. What is one thousand minus three hundred and one?		11. Divide 180 by 6.	
2. What temperature is 10 degrees less than 6 degrees Celsius?		12. 5 x 6 = 90 ÷ ?	
3. Write down the next two numbers. 101 , 95 , 89 , 83 ...		13. Subtract twenty-six from seventy-nine.	
4. What is one-seventh of forty-nine?		14. What must be added to thirty-six to make one hundred?	
5. What is three times six added to seven times five?		15. One orange costs nineteen pence. How much will three oranges cost?	
6. What are the next two numbers? -19 , -15 , -11...		16. $\square$ + 15 = 120 ÷ 4	
7. Two factors of 20 add up to 6. What are they?		17. (8 x 4) - (7 x 3) =	
8. Multiply 1.4 by 100.		18. What is 56 divided by 8 ?	
9. Which is the biggest number. 1.13 0.13 1.03 0.103 1.3		19. What number is half-way between six and twenty-four?	
10. Five sweets cost 30p altogether. How much do seven sweets cost?		20. The coordinates of a square are (3,2), (8,2), (8,7) and (?,?)	

Mixed G

1. What number is two less than three hundred and one?		11. Divide 240 by 6.	
2. What temperature is 9 degrees less than 5 degrees Celsius?		12. 5 x 4 = 80 ÷ ?	
3. Write down the next two numbers. 41 , 36 , 31 , 26 , ... , ...		13. Subtract 35 from 52.	
4. What is one-sixth of forty-eight?		14. What must be added to 56 to make one hundred?	
5. What is 3 x 4 added to 6 x 5 ?		15. One orange costs 16p. How much will three oranges cost?	
6. What are the next two numbers? 2.4 , 2.6 , 2.8 , ... , ...		16. 20 - ☐ = 28 ÷ 4	
7. Two factors of 16 add up to 9. What are they?		17. (5 x 3) + (18 ÷ 2) =	
8. Divide 510 by 10		18. What is the sum of 24 and 12 divided by 9?	
9. Which is the biggest number? 2.07 2.24 2.4 2 2.04		19. What number is half-way between twenty-three and fifty-one?	
10. 5 biscuits cost 30p altogether. How much do 7 biscuits cost?		20. The coordinates of a square are (-1,-1), (3,-1), (3,3) and (?,?)	