Year 6

Mathematics

Practice Questions

Algebra

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Section One: Sequences

1

[2007]

Here is part of a number sequence.

The numbers increase by the same amount each time.

| 750 | 755 | 760 | 765 | 770 |
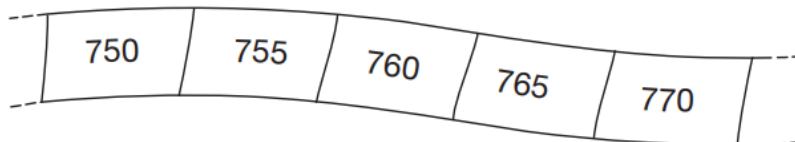
The sequence continues.

Circle **all** of the numbers below that would appear in the sequence.

840   905   989   1000   2051

[1 mark]

2

[2011]

Here is part of a number sequence.

The numbers in the sequence increase by 25 each time.

50   75   100   125   …

Circle **all** of the numbers below that will appear in the sequence.

255   650   735   900   995

[1 mark]

4

The numbers in this sequence increase by 14 each time.

Write the missing numbers.

| | 82 | 96 | | 124 | 138 | |

[2 marks]

5

The numbers in this sequence increase by 30 each time.

20   50   80   110 …

The sequence continues in the same way.

Which number in the sequence will be **closest to 300**?

Show your method

[2 marks]

16

8

The numbers in this sequence increase by 10 each time.

$$3 \quad 13 \quad 23 \quad \ldots$$

The sequence continues in the same way.

Write **two** numbers from the sequence that add to make a total of **96**

and

Explain why it is **not** possible to find **three** numbers from the sequence that add to make a total of **96**

[2 marks]

9

The numbers in this sequence increase by the same amount each time.

Write the two missing numbers.

610   650   690

[2 marks]

14

The numbers in this sequence increase by the same amount each time.

Write the missing numbers.

	1	$1\frac{5}{8}$	$2\frac{1}{4}$	

[2 marks]

15

The numbers in this sequence increase by 7 each time.

1   8   15   22   29   ....

The sequence continues in the same way.

Will the number 777 be in the sequence? Circle **Yes** or **No**.

Yes / No

Explain how you know.

[1 mark]

18

16 The numbers in this sequence increase by equal amounts each time.

[2015]

Write in the three missing numbers.

| 1 | | | | 7 |

[1 mark]

---

17 Here is a sequence of patterns made from squares and circles.

[2001]

number of squares	number of circles
1	3
2	5
3	7

The sequence continues in the same way.

Calculate how many **squares** there will be in the pattern which has **25 circles**.
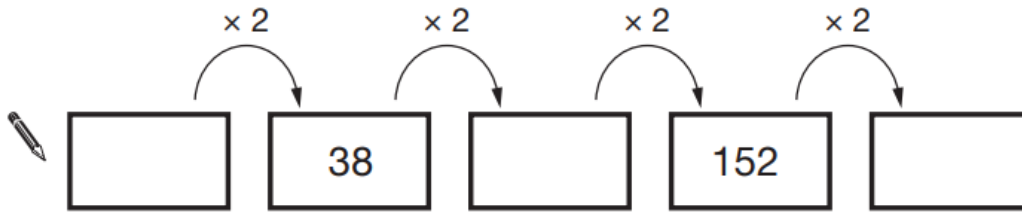
Show your method

[2 marks]

19

1

Here is a doubling sequence.

Write the three missing numbers.

| ×2 | ×2 | ×2 | ×2 |

| | 38 | | 152 | |

[2 marks]

2

Hayley makes a sequence of numbers.

Her rule is

'find half the last number then add 10'

Write in the next two numbers in her sequence.

36   28   24   [   ]   [   ]

[2 marks]

3

In this sequence each number is double the previous number.

Write in the missing numbers.

[   ]   [   ]   3   6   12   24   48   [   ]

[2 marks]

20
21

Section Two:

Algebraic Expressions

1

[2010]

k stands for a number.

Complete the number sentences below.

One has been done for you.

5 more than k is $\underline{\quad k + 5 \quad}$

2 less than k is $\underline{\hspace{3cm}}$

3 more than twice k is $\underline{\hspace{3cm}}$

6 more than half of k is $\underline{\hspace{3cm}}$

[2 marks]

2

[Extra]

Simplify these expressions.

$$5k + 7 + 3k = \dots\dots\dots\dots\dots\dots$$

$$k + 1 + k + 4 = \dots\dots\dots\dots\dots\dots$$

[2 marks]

3

[Extra]

When $x = 8$, what is the value of $5x$?

Tick (✓) the correct box below.

☐ 5   ☐ 13   ☐ 40   ☐ 58   ☐ None of these

[1 mark]

6

Here is an expression.

$$2a + 3 + 2a$$

Which expression below shows it written as simply as possible?

Put a ring round the correct one.

$7a$ $\qquad$ $7 + a$ $\qquad$ $2a + 5$

$\qquad$ $4a + 3$ $\qquad$ $4(a + 3)$

Here is a different expression.

$$3b + 4 + 5b - 1$$

Write this expression as simply as possible.

_____

[2 marks]

7

Complete the statements below.

When x is ....8...., ...$4x$.... is ....

When x is ...., ...$4x$.... is ...48...

25

10

[Extra]

A ruler costs k pence.

A pen costs m pence.

Match each statement with the correct expression for the amount in pence.

The first one is done for you.

Statement		Expression
		$5k$
The total cost of 5 rulers		$5m$
		$5 - 5m$
The total cost of 5 rulers and 5 pens		$500 - 5m$
		$5k + m$
How much more 5 pens cost than 5 rulers		$5(k + m)$
		$5m - 5k$
The change from £5, in pence, when you buy 5 pens		$5k - 5m$

[2 marks]

11

[Extra]

When $x = 8$, what is the value of $3x - x$?

Tick (✓) the correct box below.

☐ 0   ☐ 3   ☐ 16   ☐ 30   ☐ None of these

[1 mark]

12

Write the missing numbers.

$$6x + 2 = 10$$

so $6x + 1 = $ _____

$$1 - 2y = 10$$

so $(1 - 2y)^2 = $ _____

[2 marks]

13

When $y = 1$, which expression below has the **largest value**?

Put a ring round it.

$3 + y$ $\qquad\qquad$ $10 - y$ $\qquad\qquad$ y^2

$\qquad\qquad$ $3y$ $\qquad\qquad\qquad$ $\dfrac{y}{2}$

[1 mark]

14

Look at the equation.

$$14n = 98$$

Work out the value of **140n**

_____

[1 mark]

27

28

Section Three:
Formulae

1

Maria bakes cakes and sells them in bags.

She uses this formula to work out
how much to charge for one bag of cakes.

Cost = number of cakes × 20p + 15p for the bag
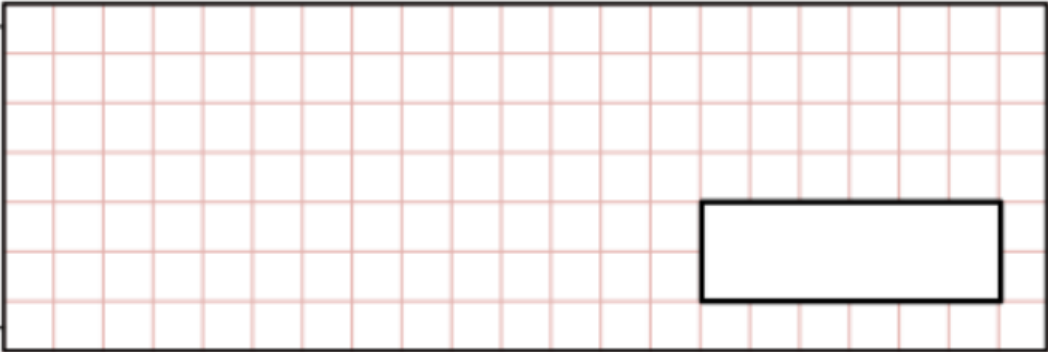
How much will a bag of 12 cakes cost?

£

Olivia buys a bag of cakes for £5.15

Use the formula to calculate how many cakes are in the bag.

Show your method

[3 marks]

2

Here is the rule that an electrician uses to work out how much to charge a customer.

> **Cost in pounds = 25 × hours worked + 55**

The electrician takes **three hours** to replace some electrical cable and some sockets.

Use the rule to work out how much the electrician should charge the customer.

£

[2 marks]

3

Here is a rule for the time it takes to cook a chicken.

> **Cooking time = 20 minutes plus an extra
> 40 minutes for each kilogram**

How many minutes will it take to cook a 3 kg chicken?

minutes

What is the mass of a chicken that takes 100 minutes to cook?

kg

[2 marks]

10

The cost to hire a boat on a lake is worked out using the information below.

Cost to hire a boat:
£4.50 per boat
and then
£3.50 per hour

Four friends hire a boat for five hours.

They share the cost equally.

How much does **each** person pay?

£

Chen's family hires a boat and pays a total of £15

How many hours did they have the boat for?

hours

[2 marks]

14 To find the nth triangular number, you can use this rule.

[Extra]

$$n\text{th triangular number} = \frac{n}{2}(n+1)$$

Example: 3rd triangular number $= \frac{3}{2}(3+1)$

$$= 6$$

Work out the **10th** triangular number.

_____

Now work out the **100th** triangular number.

_____

[2 marks]

Section Four:
Solving Equations

1

[Extra]

Jemma thinks of a number.

She says,

'Add 3 to my number and then multiply the result by 5
The answer is 35'

What is Jemma's number?

Show your method

[2 marks]

2

[Extra]

Riaz thinks of a number.

He says,

'Halve my number and then add 17
The answer is 23'

What is Riaz's number?

Show your method

[2 marks]

3

Josh thinks of a number.

He adds 4

He multiplies his result by 3

Then he takes away 9

His final answer is 90

What number did Josh start with?

Show your method

[2 marks]

4

Lara chooses a number less than 100

She divides it by 3 and then subtracts 11

She then divides this result by 2

Her answer is 10.5

What was the number she started with?

Show your method

[2 marks]

5

Seb had some cherries.

Every day he ate 10 cherries and gave 5 away.

After he gave the last 5 cherries away, he had eaten 40 cherries altogether.

How many cherries did Seb have at the start?

Show your method

[2 marks]

6

Liam thinks of a number.

He divides it by 9 and then adds 25 to the result.

His answer is 36

What number did Liam start with?

Show your method

[2 marks]

7

Lara chooses a number less than 20
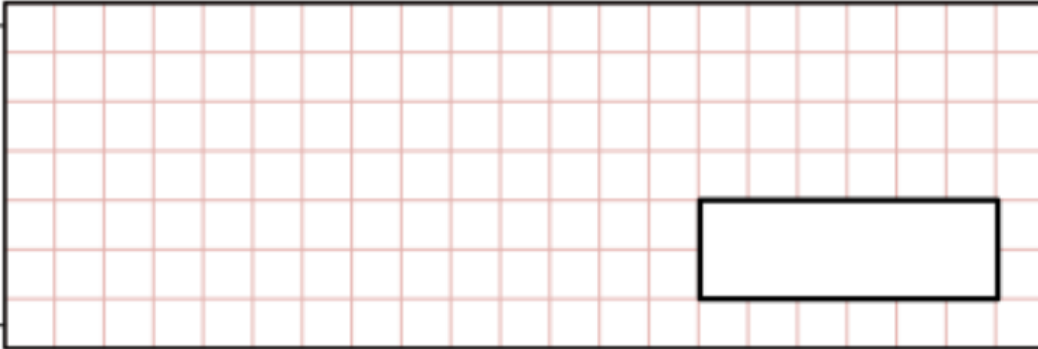
She divides it by 2 and then adds 6

She then divides this result by 3

Her answer is 4.5

What was the number she started with?

Show your method

[2 marks]

8

Monica thinks of a whole number.

She multiplies it by 3

She rounds her answer to the nearest 10

The result is 40

Write all the possible numbers that Monica could have started with.

_____

[2 marks]

10

Dev thinks of a **whole** number.

He multiplies it by 4

He rounds his answer to the nearest 10

The result is 50

Write **all** the possible numbers that Dev could have started with.

_____

[2 marks]

Section Five: Problem Solving

1

Each shape stands for a number.

←Total 100

↑
**Total
96**
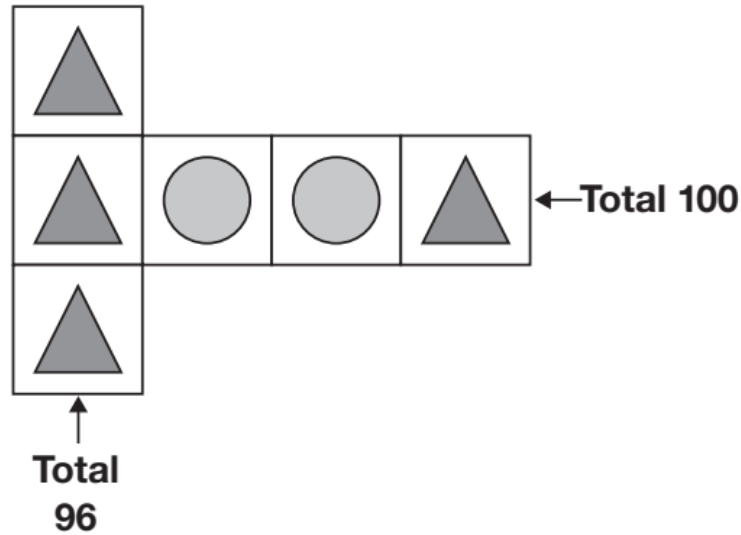
> Work out the **value** of each shape.

△ = _____

◯ = _____

[2 marks]

2

n stands for a whole number.

2n is greater than 30
5n is less than 100

> Write **all** the numbers that *n* stands for.

_____

[1 mark]

5

6 pencils cost **£1.68**
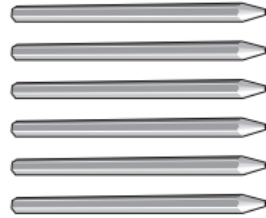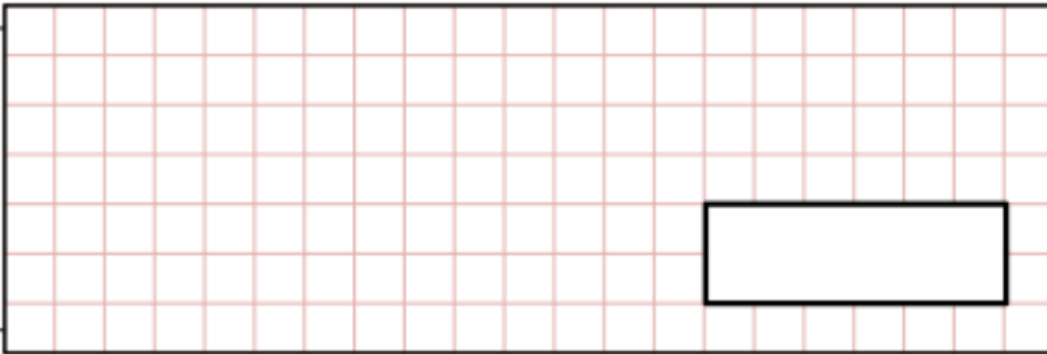
3 pencils and 1 rubber cost **£1.09**
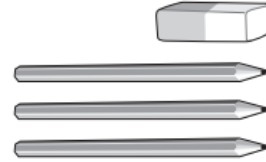
What is the cost of **1 rubber**?

Show your method

[2 marks]

6

Here is an equation.

$$m - 2n = 10$$

When $n = 20$ what is the value of m?

$m =$ _____

When $m = 20$ what is the value of n?

$n =$ _____

[2 marks]

45

9

$n = 22$

What is $2n + 9$?

$2q + 4 = 100$

Work out the value of q.

$q = $

[2 marks]

10

Sapna and Robbie have some biscuits.

Altogether they have **14** biscuits.

Sapna has **2 more** biscuits than Robbie.

How many biscuits do Sapna and Robbie each have?

Sapna   Robbie

[2 marks]

20

[2014]

Alfie has two sticks.

He puts them end to end.

Not actual size

← 80cm →
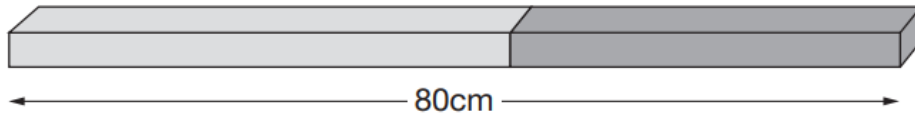
One stick is **10cm longer** than the other stick.

How long is the longest stick?

cm

[1 mark]

21

[2010]

Sarah, Amy and Liam stand on some weighing scales two at a time.

Here are the measurements:

Sarah and Amy   **70 kg**

Sarah and Liam   **80 kg**

Liam and Amy   **80 kg**
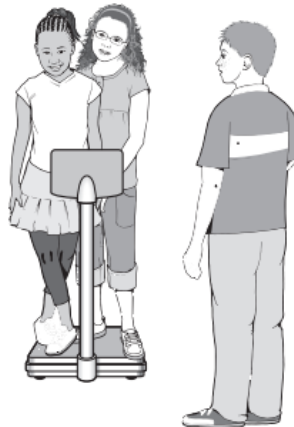
How much does Liam weigh?

Show your method

[2 marks]

47

22

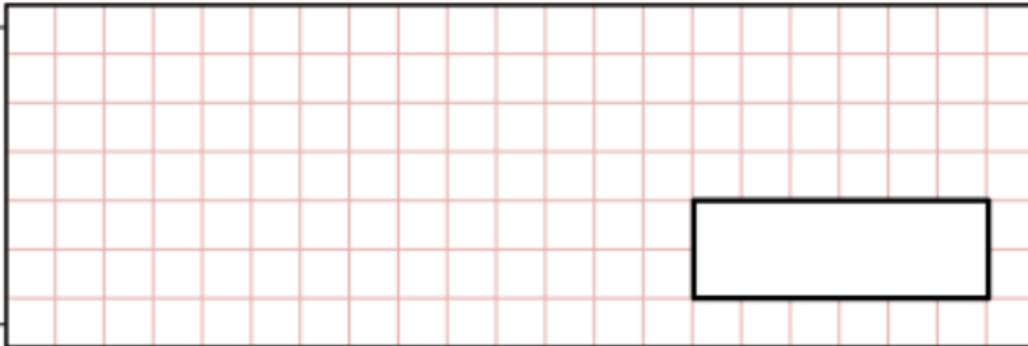Hassan bought **a notebook** and **a pen**.
He paid **£1.10**

Kate bought **a notebook** and **2 pens**.
She paid **£1.45**
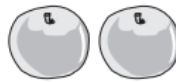
Calculate the cost of a notebook.

Show your method

[2 marks]

23

A shop sells fruit.
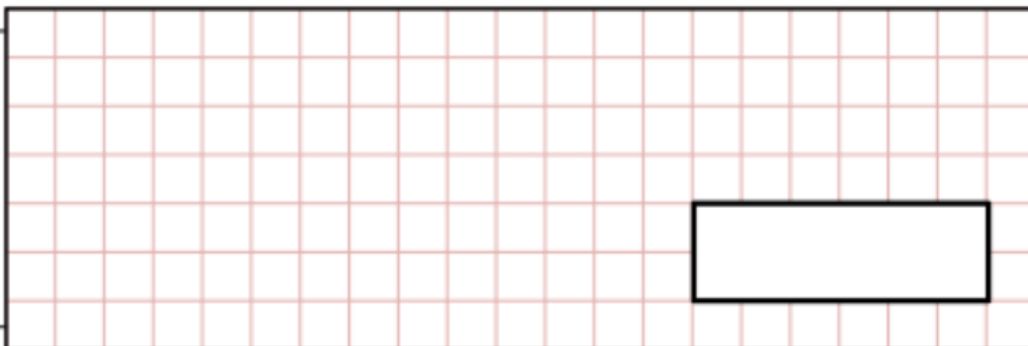
Chen buys 2 apples and 3 bananas.
He pays £2.35

Megan buys 2 apples and 1 banana.
She pays £1.25

How much does one banana cost?

Show your method

[2 marks]

48