Ma

KEY STAGE 3

TIERS 4–6

2006

Mathematics test

Paper 1

Calculator **not** allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below.

First name _____

Last name _____

School _____

Remember

- The test is 1 hour long.
- You **must not** use a calculator for any question in this test.
- You will need: pen, pencil, rubber and a ruler.
- Some formulae you might need are on page 2.
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only | Total marks |

QCA/06/1926

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Instructions

Answers



This means write down your answer or show your working and write down your answer.

Calculators



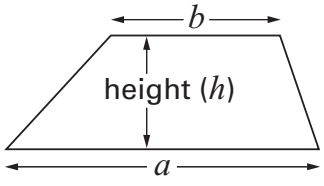
You **must not** use a calculator to answer any question in this test.

Formulae

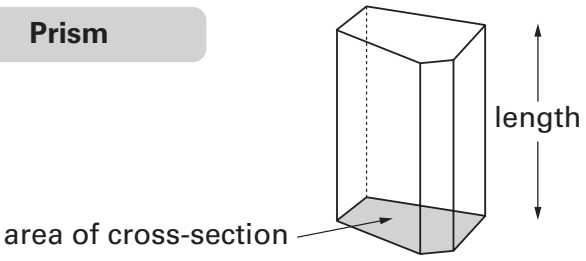
You might need to use these formulae

Trapezium

Area = $\frac{1}{2}(a + b)h$



Prism

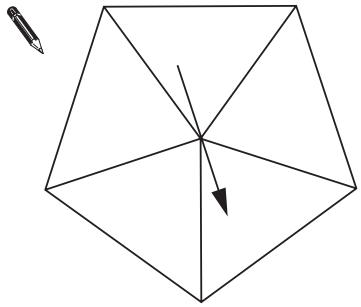


Volume = area of cross-section × length

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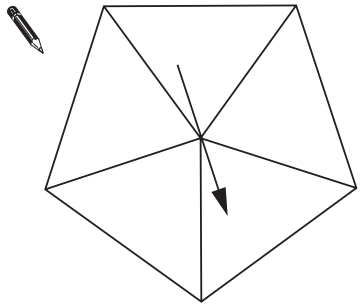
1. On each spinner **write five numbers** to make the statements correct.

It is **certain** that you will get a number **less than 6**



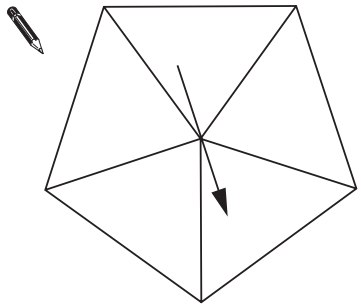
1 mark

It is **more likely** that you will get an **even** number than an **odd** number.



1 mark

It is **impossible** that you will get a **multiple of 3**

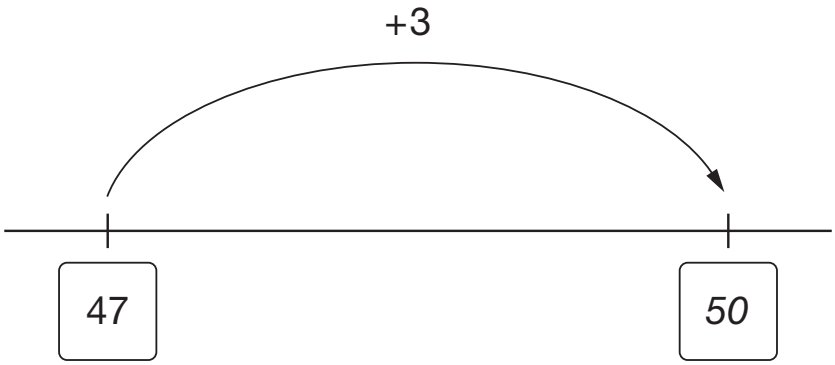


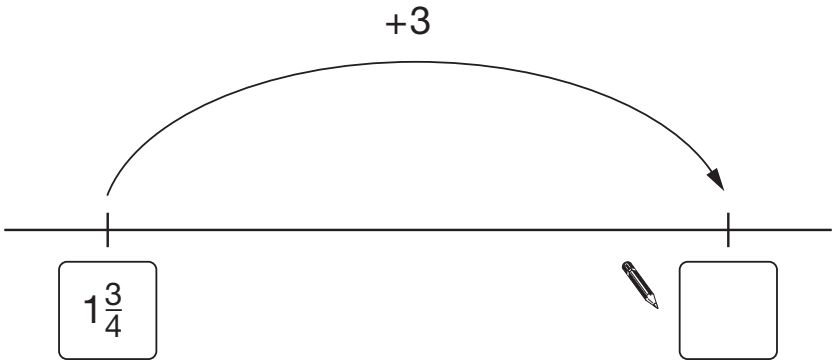
1 mark

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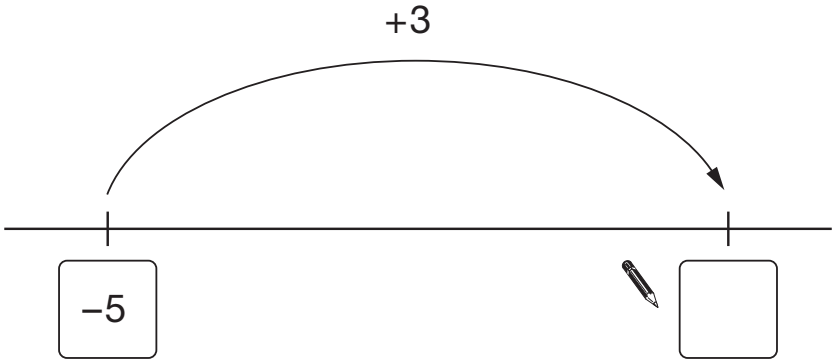
2. **Add three** to the number on each number line.

The first one is done for you.





1 mark



1 mark

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3. Work out the missing numbers.

In each part, you can use the first line to help you.

(a)

$16 \times 15 = 240$

$16 \times ____ = 480$

1 mark

(b)

$46 \times 44 = 2024$

$46 \times 22 = ____$

1 mark

(c)

$600 \div 24 = 25$

$600 \div ____ = 50$

1 mark

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4. Red Kites are large birds that were very rare in England.

Scientists set free some Red Kites in 1989 and hoped they would build nests.

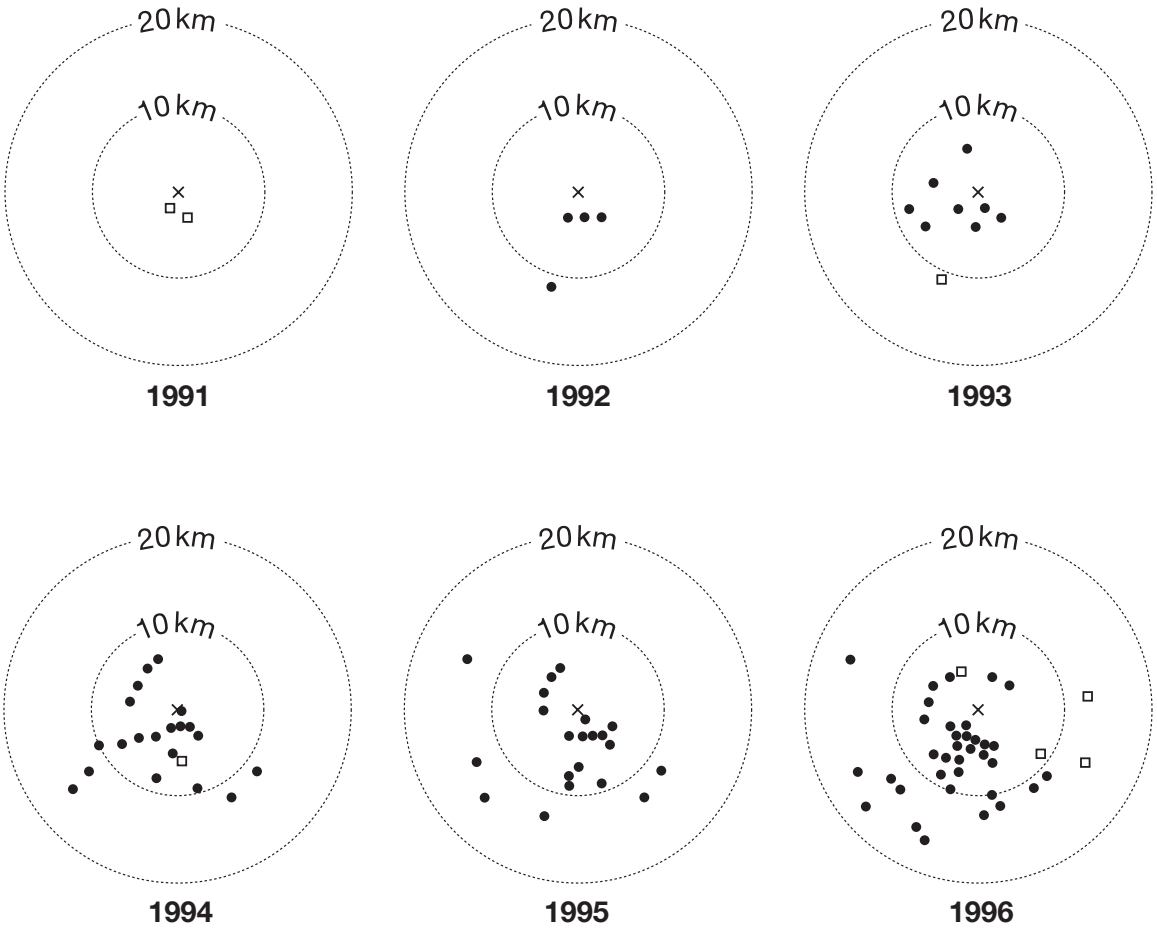
The diagrams show how many nests the birds built from 1991 to 1996.

Key:

× shows where the birds were set free.

▫ represents a nest without eggs.

• represents a nest with eggs.



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Use the diagrams to answer these questions.

(a) Which was the first year there were nests **with eggs**?

_____

1 mark

(b) In **1993**, how many nests were there **without eggs**?

_____

1 mark

(c) In **1995**, how many nests were **more than 10 km** from where the birds were set free?

_____

1 mark

(d) Explain what happened to the **number** of nests, over the years.

1 mark

Now explain what happened to the **distances** of the nests from where the birds were set free, over the years.

1 mark

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5. (a) **Add** together 1740 and 282



1 mark

(b) Now **add** together 17.4 and 2.82

You can use part (a) to help you.



1 mark

(c) 3.5 + 2.35 is **bigger** than 3.3 + 2.1

How much bigger?

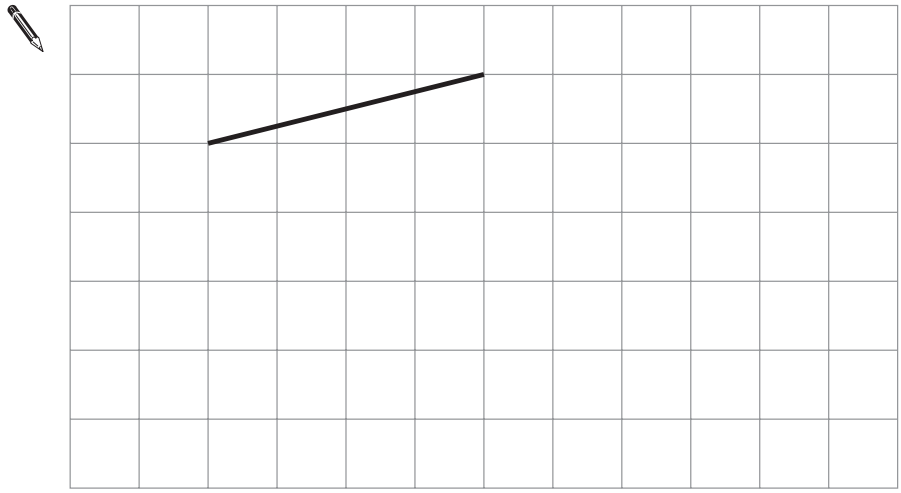


2 marks

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6. (a) The line on the square grid below is one side of a **square**.

Draw 3 more lines to complete the square.

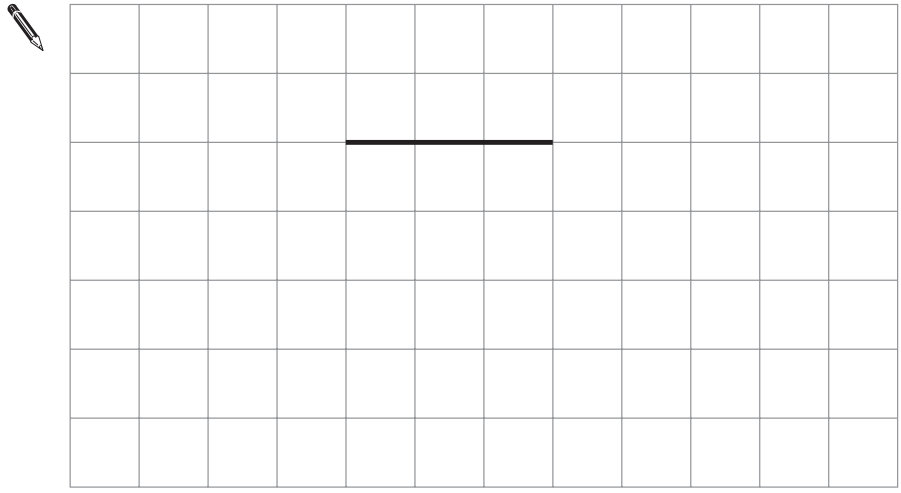


1 mark

(b) The line on the square grid below is one side of a **quadrilateral**.

The quadrilateral has **only one pair of parallel sides**.

Draw 3 more lines to show what the quadrilateral could be.



1 mark

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7. (a) Show that **9 × 28** is **252**



1 mark

(b) What is **27 × 28**?

You can use part (a) to help you.



2 marks

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8. 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
The total cost of 5 rulers	$5k$
	$5m$
	$5 - 5m$
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	$5k - 5m$

1 mark

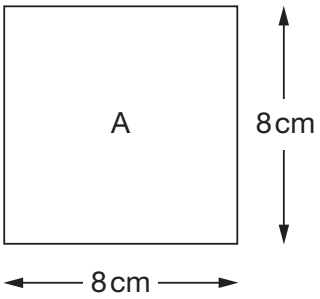
1 mark

1 mark

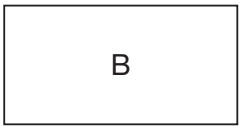
270031_KS3_MaP1_T4-6.indd 11 14/12/05 11:12:56 pm

9. (a) I have a square piece of paper.

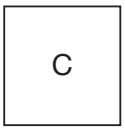
The diagram shows information about this square labelled A.



I fold square A **in half** to make rectangle B.



Then I fold rectangle B **in half** to make square C.



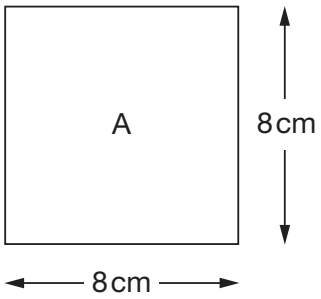
Complete the table below to show the area and perimeter of each shape.

	Area	Perimeter
Square A	cm^2	cm
Rectangle B	cm^2	cm
Square C	cm^2	cm

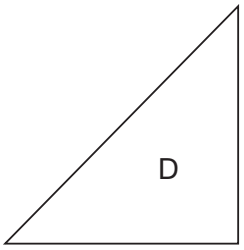
3 marks

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(b) I start again with square A.



Then I fold it **in half** to make triangle D.



What is the **area** of triangle D?

_____ cm^2

1 mark

(c) One of the statements below is true for the **perimeter** of triangle D.

Tick (✓) the correct one.

The perimeter is less than 24 cm. ☐

The perimeter is 24 cm. ☐

The perimeter is greater than 24 cm. ☐

Explain your answer.

1 mark

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10. (a) Work out the missing values.



10% of 84 = _____

5% of 84 = _____

$2\frac{1}{2}$% of 84 = _____

2 marks

(b) The cost of a CD player is £84 **plus** $17\frac{1}{2}$ % tax.

What is the **total** cost of the CD player?

You can use part (a) to help you.



£

2 marks

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11. Solve these equations.

$2k + 3 = 11$



$k =$ _____ 1 mark

$2t + 3 = -11$



$t =$ _____ 1 mark

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12. (a) I am thinking of a number.

My number is a **multiple of 4**

Tick (✓) the true statement below.

My number must be even	My number must be odd	My number could be odd or even
☐	☐	☐

Explain how you know.

1 mark

(b) I am thinking of a **different** number.

My number is a **factor of 20**

Tick (✓) the true statement below.

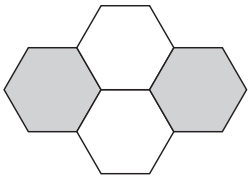
My number must be even	My number must be odd	My number could be odd or even
☐	☐	☐

Explain how you know.

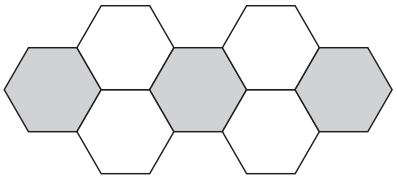
1 mark

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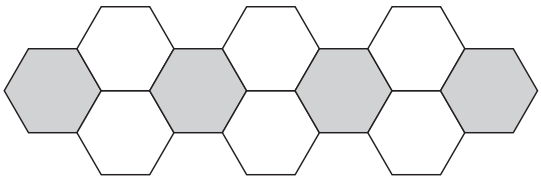
13. Look at this sequence of patterns made with hexagons.



pattern number **1**



pattern number **2**



pattern number **3**

To find the number of hexagons in pattern number n you can use these rules:

Number of **grey** hexagons	=	$n + 1$
Number of **white** hexagons	=	$2n$

Altogether, what is the total number of hexagons in **pattern number 20**?

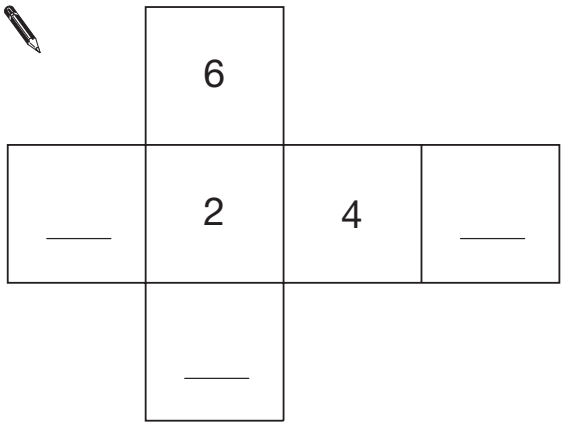
2 marks

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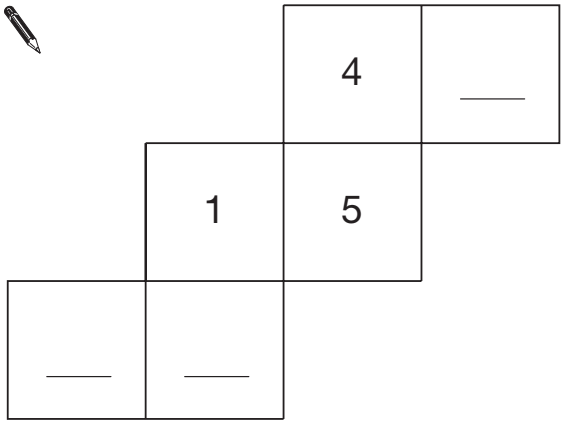
14. The diagrams show nets for dice.

Each dice has six faces, numbered 1 to 6

Write the missing numbers so that the numbers on **opposite faces add to 7**



1 mark



1 mark

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15. (a) Put these values in order of size with the **smallest first**.

5^2 3^2 3^3 2^4



_____ _____ _____ _____

smallest largest

2 marks

(b) Look at this information.

5^5 is 3125

What is $\mathbf{5^7}$?



_____

2 marks

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16. Write the correct operations (+ or – or × or ÷) in these statements.



a ____ a = 0

a ____ a = 1

a ____ a = $2a$

a ____ a = a^2

2 marks

17. Solve this equation.

$3y + 14 = 5y + 1$



y = _____

2 marks

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18. Hanif asked ten people:

'What is your favourite sport?'

Here are his results.

football	*cricket*	*football*	*hockey*	*swimming*
hockey	*swimming*	*football*	*netball*	*football*

(a) Is it possible to work out the **mean** of these results?

☐ Yes ☐ No

Explain how you know.

1 mark

(b) Is it possible to work out the **mode** of these results?

☐ Yes ☐ No

Explain how you know.

1 mark

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19. (a) Give an example to show the statement below is **not** correct.

When you multiply a number by 2, the answer is always greater than 2



1 mark

(b) Now give an example to show the statement below is **not** correct.

When you subtract a number from 2, the answer is always less than 2



1 mark

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20. Work out



$$\frac{1}{4} + \frac{1}{3} =$$

1 mark

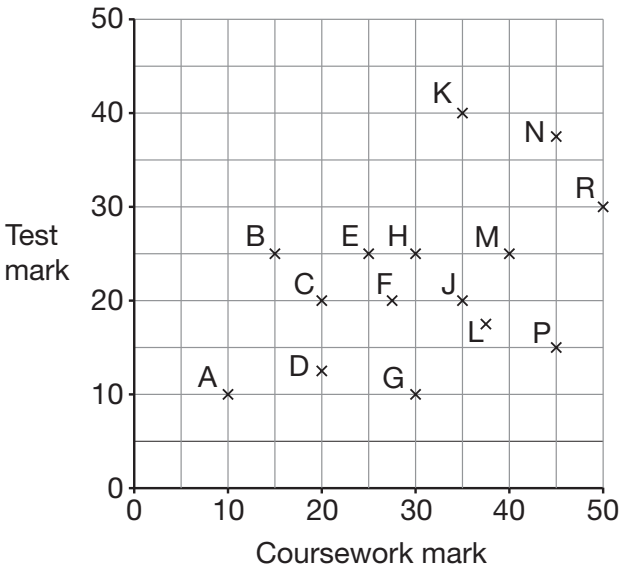
1 mark

$$\frac{3}{5} - \frac{1}{15} =$$

1 mark

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21. The scatter graph shows 15 pupils' coursework and test marks.



To find a pupil's **total** mark, you add the coursework mark to the test mark.

(a) Which pupil had the highest **total** mark?

_____

1 mark

(b) Look at the statement below. Tick (✓) True or False.

The range of coursework marks was greater than the range of test marks.

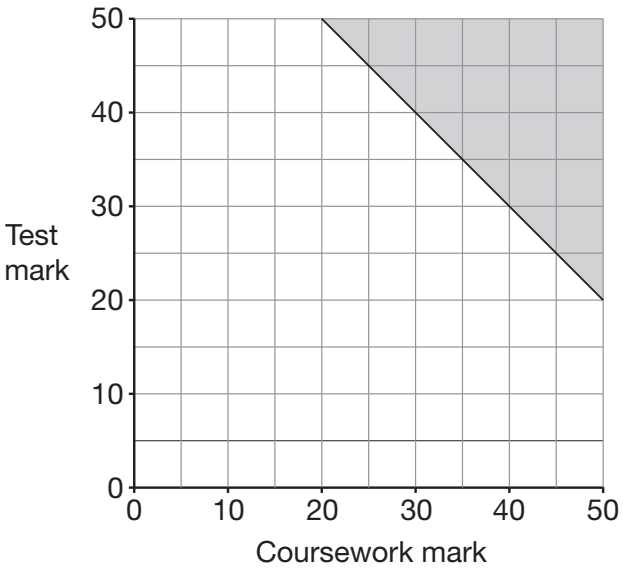
☐ True ☐ False

Explain your answer.

1 mark

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(c) Pupils with total marks in the shaded region on the graph win a prize.



What is the **smallest total mark** needed to win a prize?



_____

1 mark

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END OF TEST

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END OF TEST

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