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KEY STAGE



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# Year 9 mathematics test

Paper 2 Calculator allowed

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

# Remember:

- The test is 1 hour long.
- You may use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler and a scientific or graphic calculator.
- 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 marking use only

Total marks

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# Instructions Answers Mis means write down your Mis means write down your working and write down your answer. Calculators You may use a calculator to answer any question in this test.



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## **1.** The chart shows the popularity of different television channels.

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Children's party

**2.** A boat can be hired for children's parties.



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The formula below shows the cost.

 $Cost = \pounds 13.50 \times the number of children + \pounds 23$ 

(a) What is the cost of a party for **8 children**?

(b) A different children's party cost £225.50How many children were at the party?

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2 marks

1 mark



**3.** I make a sequence of shapes using grey and white tiles.



The total number of tiles in shape number n is 4n + 4

(a) I remove **half the tiles** to make the sequence of shapes below.



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4. The table shows information about six types of bird that can be seen in Britain.The birds are listed in order of size from biggest to smallest.

Name of	Size of	When it ca	Average	
bird	bird	Summer	Winter	length
Mistle Thrush	Biggest	$\checkmark$	$\checkmark$	31 mm
Fieldfare			$\checkmark$	29mm
Blackbird		$\checkmark$	$\checkmark$	29mm
Ring Ouzel		$\checkmark$		30 mm
Song Thrush	Cmallaat	$\checkmark$	$\checkmark$	27 mm
Redwing	Smallest		$\checkmark$	26mm

Use the table to answer these questions.

(a) What is the name of the **smallest** bird that can be seen in **summer**?

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1 mark

(b) Fred says:

In this table, the **bigger birds always have bigger egg lengths** than the smaller birds.

length

Is he correct?





Explain your answer.

1 mark

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**5.** People pay to visit a garden.

Tickets:	
Age 16 and over	£3.60
Under 16	£2.25

145 people pay.

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39 of them are under 16

How much ticket money is paid altogether?

£ \_\_\_\_\_2 marks

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6. The diagram shows a prism.



The centimetre square grid below shows part of the net for the prism.

# Complete the **net accurately**.



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Net

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Multiple

7. (a) Dave says:



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# 8. Each shape on this square grid has angles that are 45°, 90° or 135°



### Complete the table.

	А	В	С	D
Number of 45° angles	1			
Number of 90° angles	2			
Number of 135° angles	1			

9. (a) Write a number that is bigger than  $5\frac{2}{3}$  but smaller than 6

(b) Now write a number that is **bigger than 5.6** but smaller than  $5\frac{2}{3}$ 

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2 marks

1 mark

1 mark

**10.** The shaded rectangle is **twice as long** as it is wide.

The **perimeter** of the rectangle is **30cm**.

Not drawn accurately

What is the area of the rectangle?

\_\_\_\_\_ cm<sup>2</sup>

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2 marks

 Image: notation of the side lengths are in centimetres.
 n</

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(a) When n = 9, what is the perimeter of the kite?

(b) When the perimeter of the kite is **100 cm**, what is the value of *n*?



\_ cm

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1 mark

Dice probability

12. I have a fair six-sided dice, numbered 4, 9, 12, 16, 20 and 24

I am going to roll the dice.

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(a) What is the probability of rolling a **multiple of 4**?

(b) What is the probability of rolling a square number?

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1 mark

Coat, Cuboid diagonal

**13.** The price of a coat is £65

In a sale the price is reduced by 15%

What is the sale price of the coat?

£ \_\_\_\_\_2 marks

14. A cuboid has length, *l*, width, *w*, and height, *h*The distance between opposite corners is *d* 



*d* = \_\_\_\_\_

Look at the formula.

 $d^2 = l^2 + w^2 + h^2$ 

Use the formula to find the value of d when l = 6, w = 2 and h = 3

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2 marks



Possible?

<b>15.</b> (a)	Is it possible to draw a triangle with <b>angles</b> 150°, 10° and 10°?	
	Yes No	
	Explain your answer.	
Ø		
		mark
(b)	Is it possible to draw a triangle with <b>sides</b> 150cm, 10cm and 10cm?	
	Yes No	
	Explain your answer.	
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1 mark

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**16.** The pie chart shows how pupils in class 9A travelled to school one morning.



5 pupils in class 9A walked to school.

Work out how many pupils in class 9A travelled by **bus**.

\_\_\_\_\_ pupils

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1 mark

2 marks

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17. (a) Every day a machine makes 500 000 drawing pins and puts them into boxes.The machine needs 150 drawing pins to fill a box.

How many boxes can be filled with the 500 000 drawing pins?

\_\_\_\_\_ boxes

(b) Each drawing pin is made from **0.23g** of metal.How many drawing pins can be made from **1kg** of metal?

\_\_\_\_\_ drawing pins

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**18.** Here are some exchange rates.

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£1 =	2.03	American dollars
£1 =	2.15	Canadian dollars

Use the exchange rates to answer these questions.

(a) How many more Canadian dollars than American dollars would you get for £250?

dollars

(b) How many **more pounds (£)** would you get for 250 American dollars than for 250 Canadian dollars?

£

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2 marks

2 marks

19. The first square number is 1, and the sum of the first 20 square numbers is 2870Work out the sum of the first 21 square numbers.

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2 marks

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### **20.** There are five people in the Smith family.

Females	Males
Mrs Smith, 38 years old	Mr Smith, $x$ years old
Tina Smith, 9 years old	Ben Smith, $y$ years old
Helen Smith, 7 years old	

The mean age of the males is 28

What is the mean age of all five people in the family?

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2 marks

**21.** The **square** ABCD has side length 10cm.

# E is the midpoint of BC.



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Work out the length of DE.

Give your answer correct to one decimal place.

\_\_\_\_\_ cm

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3 marks



**22.** The scatter graph shows the lengths and diameters of 15 acorns.



(b) Which point on the graph shows the median length of the acorns?Put a ring round it.

1 mark

1 mark

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(c) Which scatter graph shows the line of best fit?

Tick ( $\checkmark$ ) the correct diagram.







1 mark

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World population

**23.** Look at the pie charts showing information about the world population in the years 1950 and 2000.



In the year 2000, **more** people lived in towns and cities than in 1950.

How many more?

\_\_\_\_\_ million

2 marks

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24. This question is about number sequences and what their *n*th terms could be.Write the missing information in each table.

First four terms of the sequence				<i>n</i> th term	
	3	6	9	12	3 <i>n</i>
	4	7	10	13	
					3 ( <i>n</i> + 1)

First	four terms	<i>n</i> th term		
1	4	9	16	$n^2$
0	3	8	15	
9	16	25	36	( <i>n</i> +) <sup>2</sup>

1 mark

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1 mark

1 mark

1 mark

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Kilometre

**25.** (a) Show that, at 40 km/h, it takes 1 minute 30 seconds to travel 1 km.

1 mark

1 mark

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(b) At 80km/h, how many seconds does it take to travel 1km?

\_\_\_\_\_ seconds

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# **END OF TEST**

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