Mathematics tests

Paper 1
Calculator **not** allowed

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Instructions

You **may not** use a calculator to answer any questions in this test.

Work as quickly and as carefully as you can.

You have **30 minutes** for this test.

If you cannot do one of the questions, **go on to the next one**.

You can come back to it later, if you have time.

If you finish before the end, **go back and check your work**.

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**Follow the instructions for each question carefully.**

- This shows where you need to put the answer.

If you need to do working out, you can use any space on a page.

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**Some questions have an answer box like this:**

Show your working

For these questions you may get a mark for showing your working.
1 Write the missing numbers so that $2a + 5b = 30$

One is done for you.

$2a + 5b = 30$ when $a = 0$ and $b = 6$

$2a + 5b = 30$ when $a = 5$ and $b =$ _______ 1 mark

$2a + 5b = 30$ when $a = 15$ and $b =$ _______ 1 mark
Here are an equilateral triangle and a regular pentagon.

Each side of the triangle is 10 cm
Each side of the pentagon is $d$ cm

The perimeter of the pentagon is 4 centimetres more than the perimeter of the triangle.

What number does $d$ represent?

$$d = \boxed{\text{cm}}$$

2 marks
(a) Here are five number cards.

Write the missing number so that the **mean** is 2

1 4 1 1

(b) Here are the five number cards again.

1 4 1 1

It is **not possible** to write the missing number so that the **range** is 2

Explain why not.
Alfie and his brother walked from home to their school.

Their school is 2 kilometres from home.

The graph shows information about Alfie’s journey.

(a) How does the graph show that Alfie walked at a constant speed for all of his journey?

(b) Alfie’s brother left home 10 minutes before Alfie.

He arrived at school 20 minutes after Alfie.

He walked at a constant speed for all of his journey.

At what time did Alfie overtake his brother?
Megan has a bag containing white counters and black counters.

There are 20 counters in the bag altogether.

The probability of choosing a **white** counter from the bag is 0.75

(a) How many white counters are in the bag?

(b) Megan adds more **black** counters to the bag.

How many **black** counters must she add so that the probability of choosing a **white** counter is 0.25?
Emma thinks of two prime numbers.

She adds the two numbers together.

Her answer is 36

Write all the possible pairs of prime numbers Emma could be thinking of.
The diagram shows three identical isosceles triangles.

What are the sizes of angles $r$ and $t$?

Show your working

$r = \underline{\hspace{2cm}}^\circ$

$t = \underline{\hspace{2cm}}^\circ$

2 marks
(a) Write numbers in the boxes to make this fraction calculation correct.

\[
\frac{1}{\square} + \frac{\square}{5} = \frac{7}{10}
\]

1 mark

(b) Now write two different numbers to make the calculation correct.

\[
\frac{1}{\square} + \frac{\square}{5} = \frac{7}{10}
\]

1 mark
9. Jack has two **square-based pyramids** that are the same size.

He sticks the square faces together to make a new 3-D shape.

How many **faces** and how many **edges** does his new 3-D shape have?

10. Write the missing number.

\[12.5 \div \square = 7.5 \div 1.5\]
11 The diagram shows a shaded triangle inside a rectangle.

What is the area of the shaded triangle?

Show your working

2 marks
Alfie did a survey to find which soup was most popular.

The choices were:

- tomato
- chicken
- mushroom

A quarter of the children chose chicken soup.

Four times as many children chose tomato soup as chose mushroom soup.

Alfie makes a pie chart to show this information.

What **angle** should he use for the children who chose tomato soup?
Here is a square on coordinate axes.

C is the centre of the square.

Find the coordinates of P and Q.

P is \(( , )\)

Q is \(( , )\)
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