Ampleforth College

Year 7 entry – Academic Scholarship/ Academic Development Award

Mathematics Paper

SPECIMEN PAPER

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 calculator.

Question 1

Here are the ingredients for a cordial used to make a drink.

50g ginger

1 lemon

1.5 litres of water

900g sugar

(a) Jenny is going to make this cordial with **25g** of ginger.

How much lemon, water and sugar should she use?

25g ginger

.... lemon

.... litres of water

.........g sugar

1 mark

1 mark

1 mark

(b) The finished drink should be $\frac{1}{3}$ **cordial** and $\frac{2}{3}$ **water**.
Jenny puts **100ml** of cordial in a glass.

How much water should she put with it?

.... ml
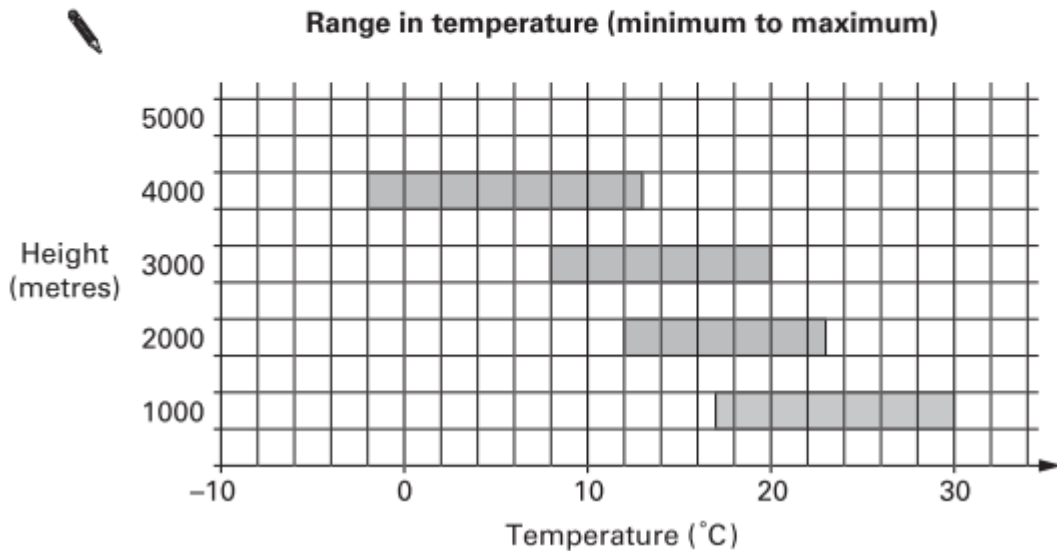
1 mark

Question 2

There are high mountains in Nepal.

At different heights, the temperature is different.

The graph shows information about temperatures in one month.

Range in temperature (minimum to maximum)

For example:

At 1000 metres, the maximum temperature is 30°C.

(a) At **3000** metres, what is the **minimum** temperature?

.... °C

1 mark

(b) At **5000** metres, the minimum temperature is –3°C.

The **range** in temperature is **15°C**.

On the graph above, draw a bar to show this information.

2 marks

Question 3

(a) A pupil measured the angles in a triangle.

She said:

> The angles are 30°, 60° and 100°

Could she be correct? Tick (✓) Yes or No.
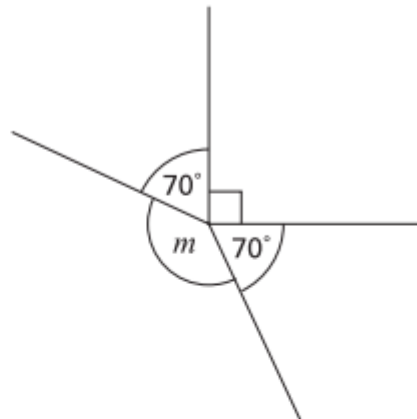
☐ Yes   ☐ No

Explain your answer.

1 mark

(b) This diagram is not drawn accurately.
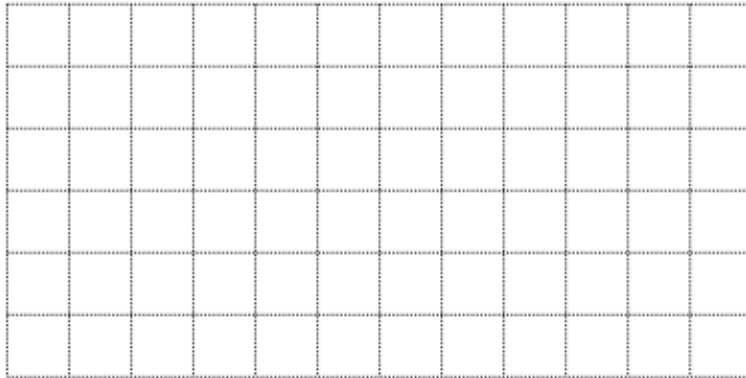
Calculate the size of angle m

Show your working.

°

2 marks

Question 4

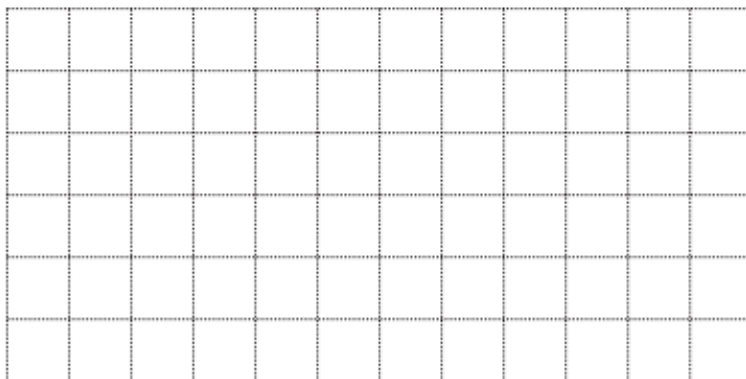The square grid below shows a **quadrilateral** that has **four right angles**.

(a) Draw a quadrilateral that has exactly **two** right angles.

(b) Draw a quadrilateral that has exactly **one** right angle.

Question 5

(a) A glass holds **225 ml**.

An adult needs about **1.8 litres** of water
each day to stay healthy.

225 ml

How many glasses is that?
Show your working.

....

2 marks

(b) An adult weighs **80 kg**.

60% of his total mass is water.

What is the mass of this water?

.... kg

1 mark

Question 6

The diagram shows part of a number grid. The grid has 6 columns.

All the **prime numbers** in the grid are **circled**.

(a) 35 is not circled.

Explain why 35 is **not** a prime number.

1 mark

(b) There are no prime numbers circled in column Y.

Explain how you know there will **never** be a prime number in column Y.

1 mark

(c) There is one prime number circled in column X.

Explain how you know there will **never** be another prime number
in column X.

1 mark

Question 7

Find the values of t and r

$$\frac{2}{3} = \frac{t}{6}$$

$t =$ ....

$$\frac{2}{3} = \frac{5}{r}$$

$r =$ ....

Question 8

(a) The square and the rectangle below have the **same area**.

Not drawn
accurately

4cm

4cm

2cm

—y cm—
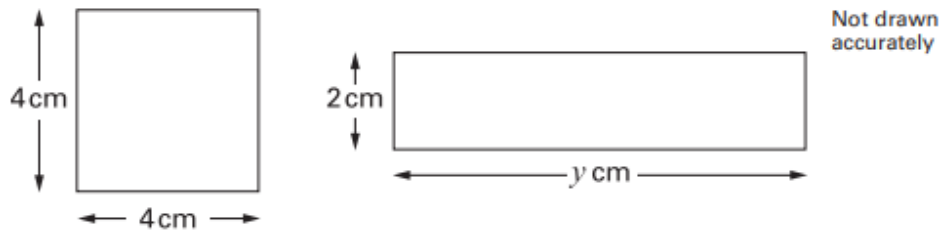
Work out the value of y

$y =$ .... cm

1 mark

(b) The triangle and the rectangle below have the **same area**.

Not drawn
accurately

6cm

4cm

w cm

4cm
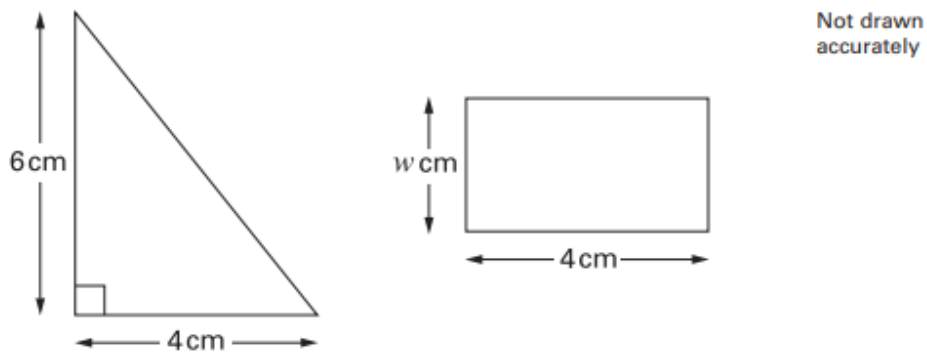
Work out the value of w

Show your working.

$w =$ .... cm

2 marks

Question 9

(a) In 1976 the average yearly wage was **£3275**

On average, people spent **17%** of £3275 on their family holiday.

How much is 17% of £3275?

Show your working.

£

(b) In 2001 the average yearly wage was **£21842**

On average, people spent **£1644** on their family holiday.

What percentage of the average yearly wage is that?

Show your working.

.... %

Question 10

There are **20 questions** in a quiz.

A **correct** answer scores **2 points**. An **incorrect** answer **loses 1 point**.

A question not answered scores 0 points. A negative total is possible.

(a) What are the maximum and minimum points you could get on the quiz?

maximum .... minimum ....

1 mark

(b) A pupil answers **10** of the 20 questions.

8 are correct.

How many points does he score?

....

1 mark

(c) Complete the table to show 3 different ways to score **24 points**.

Number of answers that are correct	Number of answers that are incorrect	Number of questions that are not answered
12	0	8

2 marks

Question 11

(a) The cross-section of a cylindrical cotton reel is a circle.

The **diameter** of this circle is **3 cm**.
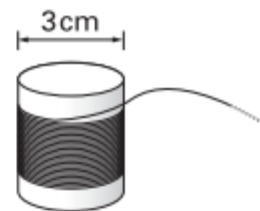
What is the **circumference** of this circle?

3 cm

.... cm

(b) **91 metres** of cotton goes round the cotton reel.

About how many times does the cotton go round the reel?

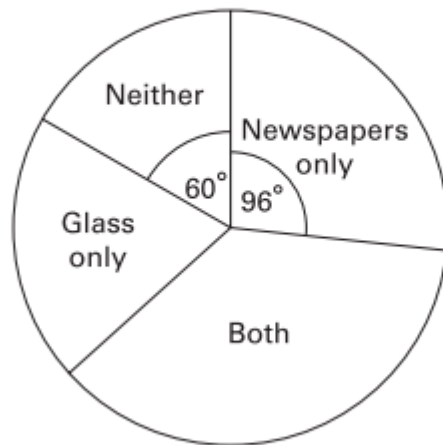Show your working, and give your answer to the **nearest ten**.

3 cm

....

Question 12

(a) A teacher asked her pupils if they recycled newspapers and glass.

The pie chart shows the results.

Neither

Newspapers
only

60°

96°

Glass
only

Both

5 pupils answered 'Neither'.

How many pupils answered 'Newspapers only'?

Show your working.

.... pupils

2 marks

(b) The teacher asked a **different class** if they recycled newspapers and glass.

There were **24 pupils** in the class.

9 pupils answered 'Newspapers only'.

On a pie chart, what would the angle be for the sector 'Newspapers only'?
Show your working.

○

2 marks

Question 13

Paul is 14 years old.

His sister is exactly **6 years younger**, so this year she is 8 years old.

This year, the ratio of Paul's age to his sister's age is **14 : 8**

14 : 8 written as simply as possible is **7 : 4**

(a) When Paul is **21**, what will be the ratio of Paul's age to his sister's age?

Write the ratio as simply as possible.

.... : ....

1 mark

(b) When his sister is **36**, what will be the ratio of Paul's age to his sister's age?

Write the ratio as simply as possible.

.... : ....

1 mark

(c) Could the ratio of their ages ever be **7 : 7**?

Tick (✓) Yes or No.

Yes ☐   No ☐
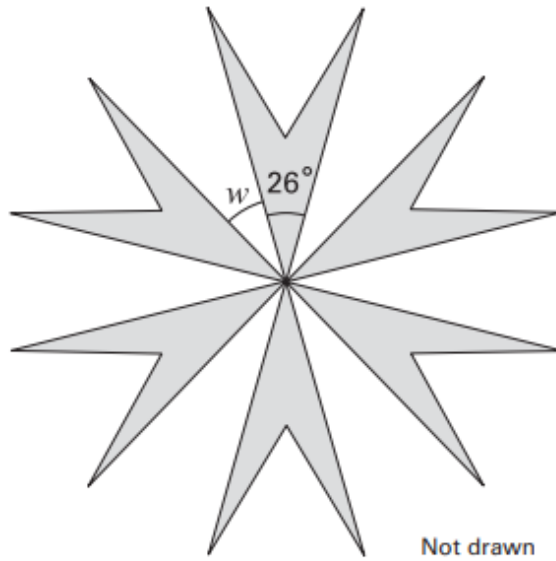
Explain how you know.

1 mark

Question 14

This pattern has rotation symmetry of order 6

What is the size of angle w ?

Show your working.

w 26°

Not drawn
accurately

..............°

2 marks

Question 15

Doctors sometimes use this formula to calculate how much medicine to give a child.

$$c = \frac{ay}{12 + y}$$

c is the correct amount for a child, in ml

a is the amount for an adult, in ml

y is the age of the child, in years

A child who is **4 years old** needs some medicine.

The amount for an adult is **20 ml**.

Use the formula to work out the correct amount for this child.

You **must** show your working.

....

2 marks

Question 16

The information in the box describes three different squares, A, B and C.

The **area** of square A is **36cm^2**

The **side length** of square B is **36 cm**

The **perimeter** of square C is **36 cm**

Put squares A, B and C in order of size, starting with the smallest.

You **must** show calculations to explain how you work out your answer.

. . . .

smallest   largest