

**Tuesday 13 June 2017 – Morning**

**GCSE METHODS IN MATHEMATICS**

**B391/01** Methods in Mathematics 1 (Foundation Tier)

Candidates answer on the Question Paper.

**OCR supplied materials:**

None

**Other materials required:**

- Geometrical instruments
- Tracing paper (optional)

**Duration:** 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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### INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

### INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- Quality of written communication will be assessed in questions marked with an asterisk (\*).
- The total number of marks for this paper is **60**.
- This document consists of **16** pages. Any blank pages are indicated.

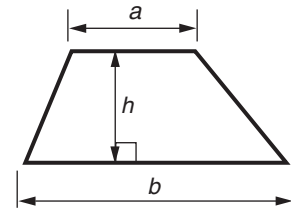
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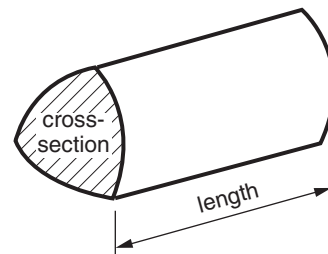
No calculator can be used for this paper

## Formulae Sheet: Foundation Tier

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



**Volume of prism** = (area of cross-section)  $\times$  length

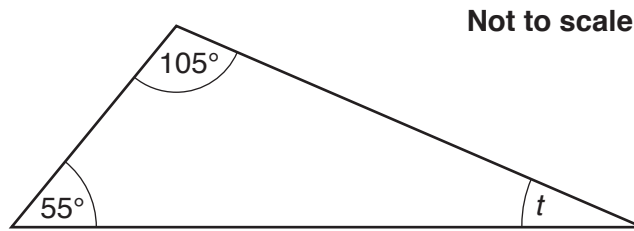


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Answer **all** the questions.

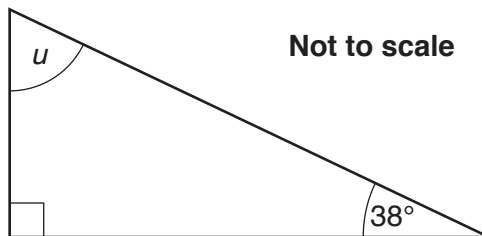
1 (a) Work out angles  $t$  and  $u$ .

(i)



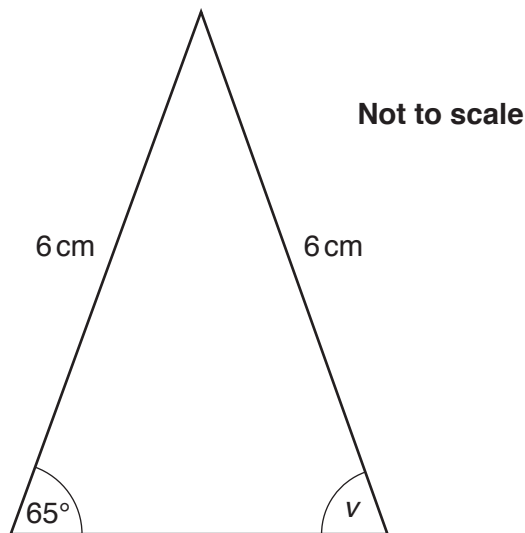
(a)(i)  $t = \dots\dots\dots^\circ$  [2]

(ii)



(ii)  $u = \dots\dots\dots^\circ$  [2]

(b) This is an isosceles triangle.



(i) Write down the size of angle  $v$ .

(b)(i)  $\dots\dots\dots^\circ$  [1]

(ii) Draw the line of reflection symmetry of the triangle. [1]

4

- 2 (a) This multiplication has been worked out correctly.

Fill in the missing number.

$$\begin{array}{r} 64 \\ \times \square \\ \hline 192 \end{array}$$

[1]

- (b) This addition has been worked out correctly.

Fill in the missing numbers.

$$\begin{array}{r} 247 \\ \square 6 + \\ \hline \square 73 \end{array}$$

[1]

3 Here is a list of words which describe probabilities.

certain      unlikely      impossible      evens      likely

There are 15 sweets in a packet. They are identical except for their colour.  
There are 3 blue sweets, 4 yellow sweets and 8 red sweets.

(a) A sweet is chosen at random from the bag.

Choose from the list of words above to complete the following sentences.

(i) It is ..... that a blue sweet will be chosen. [1]

(ii) It is ..... that a green sweet will be chosen. [1]

(b) A red sweet is taken from the bag. There are 14 sweets left.

Which word from the list above describes the probability that the next sweet chosen at random will also be red?

(b) ..... [1]

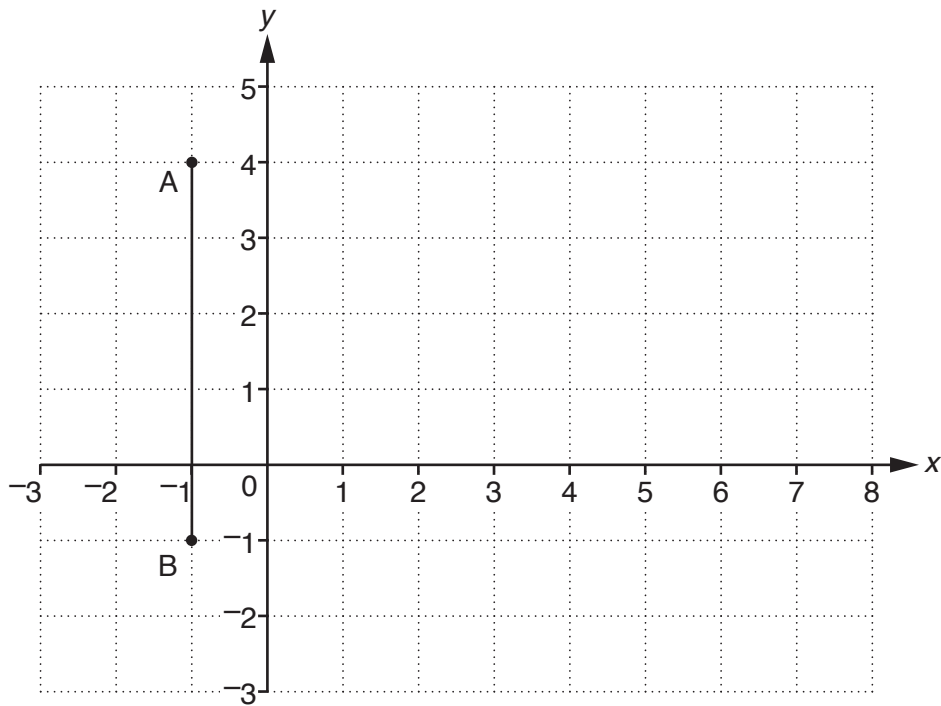
(c) The sweets also come in large packets containing 60 sweets.

The ratio of colours in the two packets is the same.

How many blue sweets should be in the large packet?

(c) ..... [1]

- 4 The line AB is plotted on this one-centimetre grid.



- (a) Write down the coordinates of point A.

(a) (....., .....) [1]

- (b) ABCD is a square. Plot points C and D on the grid and complete the shape. [1]

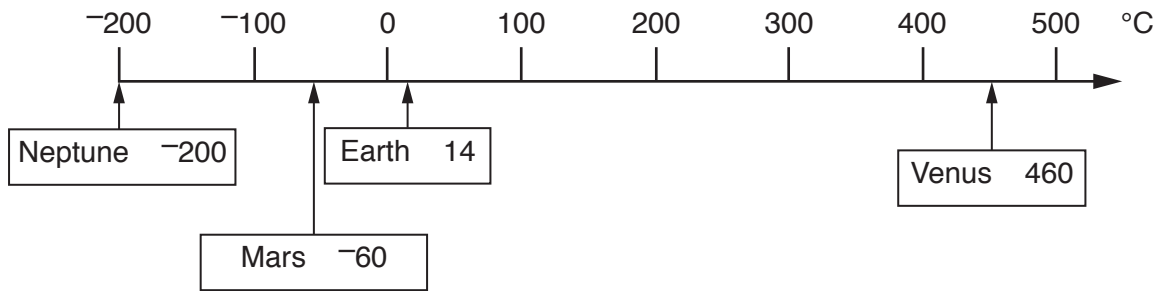
- (c) Circle the correct word at the end of this sentence.

The lines AB and DC are **perpendicular / parallel**. [1]

- (d) What is the perimeter of the square ABCD?

(d) ..... cm [1]

5 This diagram shows approximate average temperatures in °C for some planets.



(a) Complete these sentences. The first is done for you.

The average temperature of Venus is ..... **446** .....°C ..... **higher** ..... than Earth.

The average temperature of Mars is .....°C ..... than Earth.

The average temperature of Mars is .....°C ..... than Neptune. [3]

(b) Jupiter has an average temperature which is 70°C **lower** than Mars.

What is the average temperature of Jupiter?

(b) .....°C [1]

6 Kirsty has arranged some number and operation cards.

$$\boxed{3} \quad \boxed{+} \quad \boxed{4} \quad \boxed{\times} \quad \boxed{7}$$

(a) Which of the numbers 3, 4 and 7 is **not** prime?

(a) ..... [1]

(b) Kirsty has been set a challenge to find **four** different answers using these cards with the following rules.

- The numbers 3, 4 and 7 must be left where they are.
- The + and  $\times$  cards can be switched around.
- Brackets can be inserted.

The 1st answer has been filled in below.

Show how the + and  $\times$  cards can be arranged, using brackets when needed, and find the other 3 possible answers.

$$\boxed{3} \quad \boxed{+} \quad \boxed{4} \quad \boxed{\times} \quad \boxed{7} = 31$$

$$\boxed{3} \quad \boxed{\phantom{+}} \quad \boxed{4} \quad \boxed{\phantom{\times}} \quad \boxed{7} = \dots\dots\dots$$

$$\boxed{3} \quad \boxed{\phantom{+}} \quad \boxed{4} \quad \boxed{\phantom{\times}} \quad \boxed{7} = \dots\dots\dots$$

$$\boxed{3} \quad \boxed{\phantom{+}} \quad \boxed{4} \quad \boxed{\phantom{\times}} \quad \boxed{7} = \dots\dots\dots$$

[3]



- 7 A fair spinner has 3 equal sections. One is coloured red, one blue and one green. The spinner is spun twice.

(a) Complete the following sample space diagram to show the different outcomes.

		2nd spin		
		red (r)	blue (b)	green (g)
1st spin	red (r)	r, r	r, b	
	blue (b)	b, r		
	green (g)	g, r		

[2]

(b) What is the probability that, in 2 spins, the spinner lands on the same colour?

(b) ..... [2]

- 8 (a) Write in figures the number one million two hundred and thirty five thousand.

(a) ..... [1]

- (b) Write

- (i) 12.78264 correct to the nearest whole number,

(b)(i) ..... [1]

- (ii) 12.78264 correct to 1 decimal place,

(ii) ..... [1]

- (iii) 12.78264 correct to 1 significant figure.

(iii) ..... [1]

- (c) A shop owner has a 30% off sale and calculates that an item should now sell at £1.743.

What is a sensible price to label the item?

(c) £ ..... [1]

- (d) **Estimate** the value of  $0.524 \times 42$ .

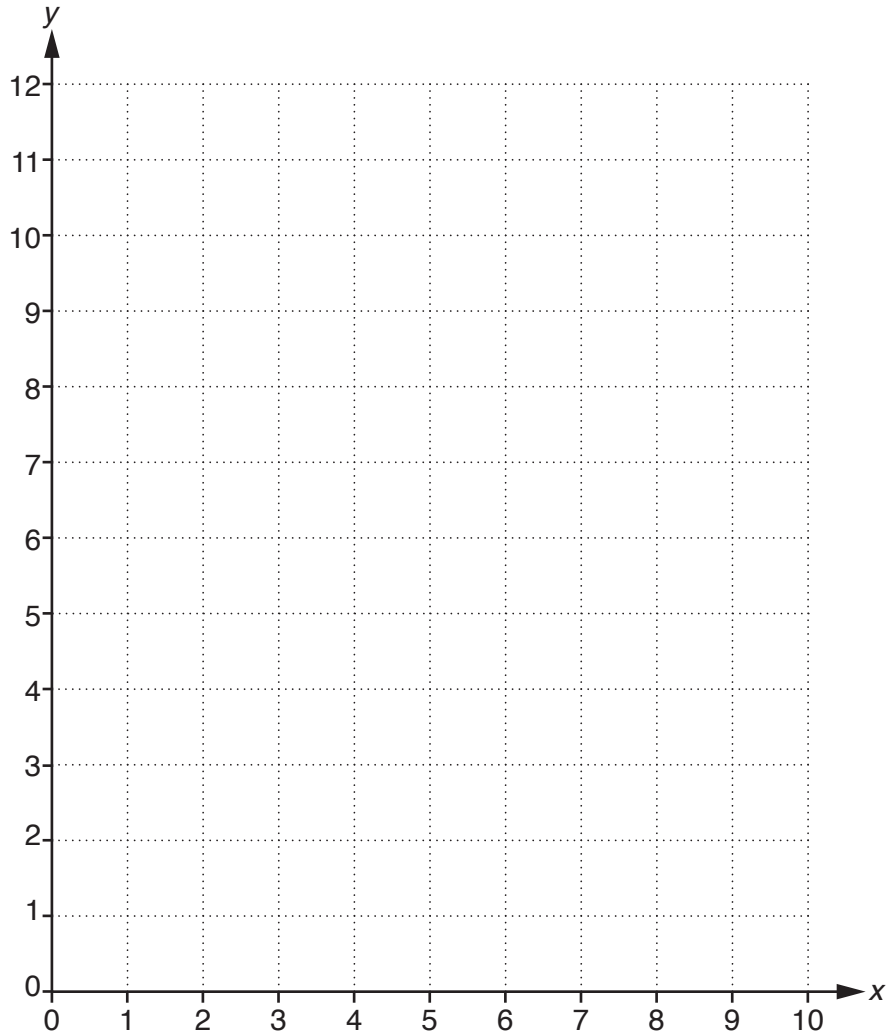
(d) ..... [2]

- 9 (a) Complete the following table of values for  $y = x + 4$ .

$x$	0	4	8
$y$	4		

[1]

- (b) Draw the line  $y = x + 4$  for values of  $x$  between 0 and 8 on the grid below.



[2]

10 (a) Musictime is a website which sells album downloads. They charge £8 per album download.  
How much would it cost to download 7 albums from Musictime?

(a) £ ..... [1]

(b) Rockout is another website which sells album downloads.  
They charge a £20 joining fee and then each album download is £5.

Complete the formula for the total cost when a customer uses the Rockout website for the first time.

$R$  is the amount spent in £ and use  $d$  for the number of downloads.

(b)  $R =$  ..... [1]

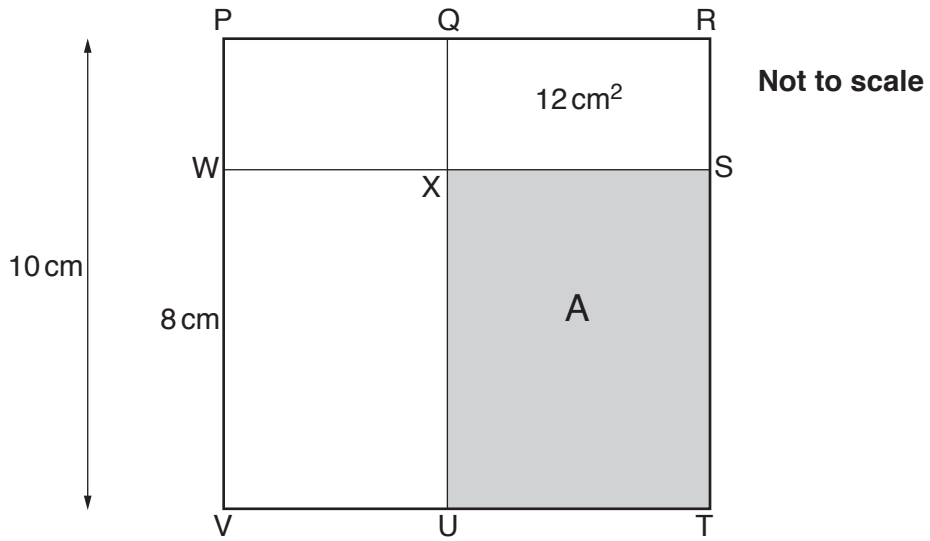
(c)\* Dylan wants to download 12 albums.  
He has never used the Rockout website.

Which of these websites, Musictime or Rockout, would be cheaper and by how much?

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..... is cheaper by £..... [3]

11



PRTV is a square with sides of 10 cm.  
 QR = UT and PW = RS.  
 VW = 8 cm and area QRSX = 12 cm<sup>2</sup>

Find the shaded area A on the diagram.

..... cm<sup>2</sup> [3]

12 One week Tim earned £350.

He saved  $\frac{2}{5}$  of it.

(a) How much did he save?

(a) £ ..... [2]

(b) He then gave a donation to charity.

He spent  $\frac{1}{4}$  of the money he had left after he had made the donation.

The amount he spent was £50.

How much money did he give to charity?

(b) £ ..... [3]

13 (a) Factorise.

$$x^2 - x$$

(a) ..... [1]

(b) Simplify.

$$3a^2 - 5a + 2a + 5a^2$$

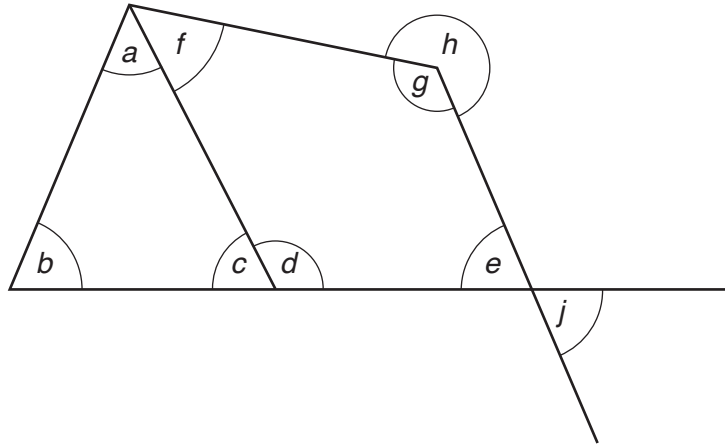
(b) ..... [2]

(c) Solve.

$$2(x - 1) = 6(x + 5)$$

(c) ..... [3]

14



(a) Write down one reflex angle and one obtuse angle.

(a) Reflex ..... Obtuse ..... [1]

(b) Write down two equal angles stating why they are equal.

..... = ..... Reason .....  
 ..... [1]

(c) Write down two angles that add up to  $180^\circ$  stating how you know they add up to  $180^\circ$ .

..... and ..... Reason .....  
 ..... [1]

**END OF QUESTION PAPER**

**ADDITIONAL ANSWER SPACE**

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines across the rest of the page, providing space for writing answers.



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