

Cambridge International Examinations

Cambridge International General Certificate of Secondary Education

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		



MATHEMATICS 0580/23

Paper 2 (Extended) October/November 2015

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator Geometrical instruments

Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

If working is needed for any question it must be shown below that question.

Electronic calculators should be used.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 70.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

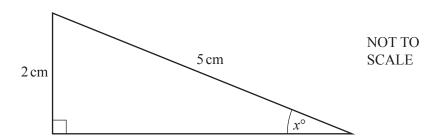


1	Write 168.9 correct to 2 sign	ificant figur	es.				
					Answer		[1]
2	Calculate $\frac{2.07 - 1.89}{5.71 - 3.92}$.						
					Answer		[1]
3	Write 1.7×10^{-4} as an ordi	inary numbe	er.				
					Answer		[1]
4	The probability that it will ra	nin on any d	ay is $\frac{1}{5}$.				
	Calculate an estimate of the	number of c	days it will r	ain in a mont	th with 30 da	ys.	
					Answer		[1]
5	11	12	13	14	15	16	
	From the list of numbers, wr	rite down					
	(a) the factors of 60,						
				An	swer(a)		[1]
	(b) the prime numbers.						
				An	swer(b)		[1]
6	Simplify. $1 - 2u + u + 4$						
					Answer		[2]
7	Factorise completely. $2x - $	- 4 <i>x</i> ²					
					Answer		[2]

8 Find the sum of the interior angles of a 25-sided polygon.

Angwar	гот
Answer	 141

9



Calculate the value of *x*.

$$Answer x = \dots [2]$$

- 10 Find the value of
 - (a) $(\sqrt{5})^8$,

(b)
$$\left(\frac{1}{27}\right)^{-\frac{2}{3}}$$
.

11 Write the following as single fractions.

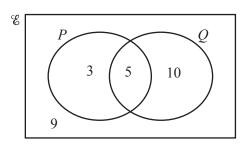
(a)
$$x + \frac{x}{2}$$

Answer(a) [1]

(b)
$$x + \frac{2}{x}$$

Answer(b) [1]

12



The Venn diagram shows the number of elements in each set.

(a) Find $n(P' \cap Q)$.

4	F 4	-
Amounoulai	11	- 1
Answer(a)	 11	. 1

(b) Complete the statement
$$n(....) = 17$$
. [1]

13
$$\mathbf{M} = \begin{pmatrix} 7 & u \\ 2 & 3 \end{pmatrix}$$
 and $|\mathbf{M}| = 1$.

Find the value of u.

 $Answer u = \dots [2]$

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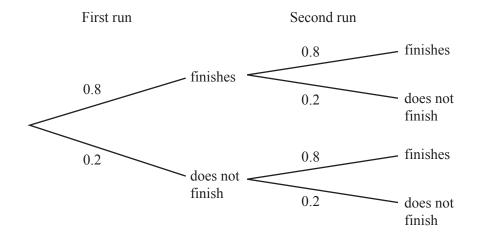
14	Two containers are mathematically similar. Their volumes are 54 cm ³ and 128 cm ³ . The height of the smaller container is 4.5 cm.						
	Calculate the height of the larger container.						
	Answer	cm [3					
15	Work out $\frac{2}{3} + \frac{1}{6} - \frac{1}{4}$, giving your answer as a fraction in its lowest terms.						
	Do not use a calculator and show all the steps of your working.						
	Answer	[3					
16	Make a the subject of the formula $s = ut + \frac{1}{2}at^2$.						
	Answer $a = \dots$	[3					

17 Simplify.

$$\left(\frac{x^{64}}{16v^{16}}\right)^{\frac{1}{4}}$$

18 Samira takes part in two charity runs.

The probability that she finishes each run is 0.8.

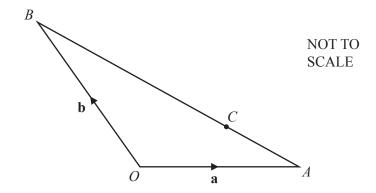


Find the probability that Samira finishes at least one run.

19	y is inversely proportional to $(x + 2)^2$. When $x = 1$, $y = 2$.								
	Find y in terms of x .								
	Answer y = [2]								
20	The volume of a cuboid is 878 cm ³ , correct to the nearest cubic centimetre. The length of the base of the cuboid is 7 cm, correct to the nearest centimetre. The width of the base of the cuboid is 6 cm, correct to the nearest centimetre.								
	Calculate the lower bound for the height of the cuboid.								
	<i>Answer</i> cm [3]								

21	Solve the equation $3x^2 + 4x - 5 = 0$. Show all your working and give your answers correct to 2 decimal places.						
	, and the second				1		
				Answer	<i>x</i> =	or <i>x</i> =	[4]
22	Simplify.	$\frac{4+10w}{8-50w^2}$					
					Answer		[4]

23



In the diagram, O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$. C is on the line AB so that AC: CB = 1:2.

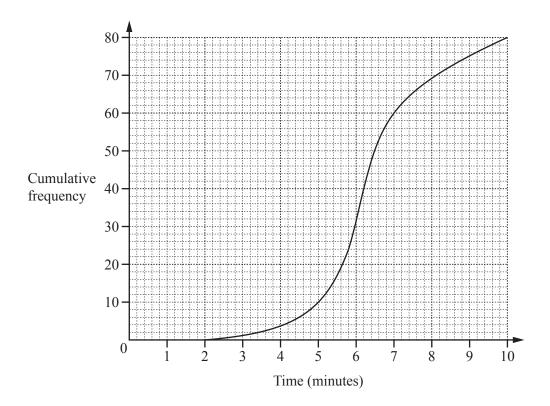
Find, in terms of **a** and **b**, in its simplest form,

(a) \overrightarrow{AC} ,

$$Answer(a) \overrightarrow{AC} = \dots [2]$$

(b) the position vector of C.

24



The cumulative frequency diagram shows information about the times, in minutes, taken by 80 students to complete a short test.

Find

-	`	41	1.
(a)	the	median.

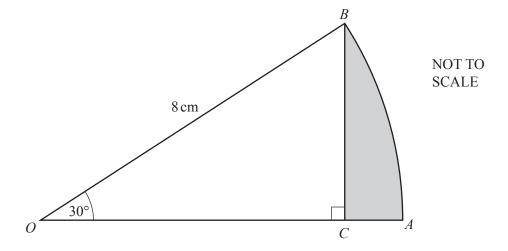
Answer(a) min [1]

(b) the 30th percentile,

Answer(b) min [2]

(c) the number of students taking more than 5 minutes.

Answer(c) [2]



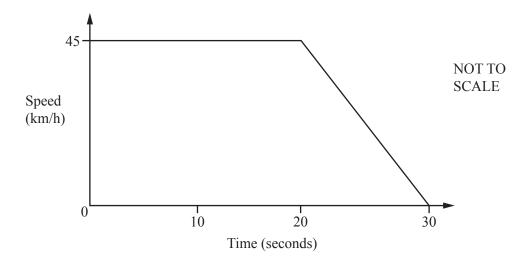
OAB is the sector of a circle, centre O, with radius 8 cm and sector angle 30°. BC is perpendicular to OA.

Calculate the area of the region shaded on the diagram.

Answer cm² [5]

Question 26 is printed on the next page.

26



The diagram shows the speed-time graph of a car.

The car travels at 45 km/h for 20 seconds.

The car then decelerates for 10 seconds until it stops.

(a) Change 45 km/h into m/s.

Answer(a)		m/s	[2]	
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(b) Find the deceleration of the car, giving your answer in m/s².

(c) Find the distance travelled by the car during the 30 seconds, giving your answer in metres.

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