## \*WORKED SOLUTIONS \*

#### Surname

First name(s)

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## GCSE

C300U20-1

A22-C300U20-1



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Candidate

Number

Centre

Number

### THURSDAY, 3 NOVEMBER 2022 – MORNING

### MATHEMATICS – Component 2 Calculator-Allowed Mathematics FOUNDATION TIER

2 hours 15 minutes

#### ADDITIONAL MATERIALS

An additional formulae sheet.

A calculator will be required for this examination.

A ruler, protractor and a pair of compasses may be required.

#### INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer all the questions in the spaces provided.

If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

Take  $\pi$  as 3.142 or use the  $\pi$  button on your calculator.

#### INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

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

You are reminded of the need for good English and orderly, clear presentation in your answers.



For Ex	aminer's us	e only
Question	Maximum Mark	Mark Awarded
1.	7	
2.	6	
3.	4	
4.	5	
5.	4	
6.	4	
7.	7	
8.	7	
9.	5	
10.	4	
11.	2	
12.	9	
13.	5	
14.	6	1
15.	3	
16.	2	
17.	5	
18.	5	· ·
19.	4	
20.	2	
21.	4	
22.	7	
23.	7	
24.	6	
Total	120	

#### Formula list

2

Area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

```
Curved surface area of a cone = \pi rl
Surface area of a sphere = 4\pi r^2
Volume of a sphere = \frac{4}{3}\pi r^3
Volume of a cone = \frac{1}{3}\pi r^2h
```

#### **Kinematics formulae**

Where *a* is constant acceleration, *u* is initial velocity, *v* is final velocity, *s* is displacement from the position when t = 0 and *t* is time taken:

v = u + at $s = ut + \frac{1}{2}at^{2}$  $v^{2} = u^{2} + 2as$ 



Examiner 1. Enzo and Jane are taking a group of children to the beach for a day trip. only They go to a shop to buy some items for the trip. Toy duck **Bucket** Set of spades Beach ball £2.35 £3.20 £4.10 95p x 15 x 17Complete Enzo's bill below. [4] (a) Enzo's Bill  $f_{f}35.25$ 15 **Buckets** 3.... £12.30 - 4.10 Sets of spades £ 16-15 17 Toy ducks C300U201 03 £63.70 Total  $12.30 \div 4.10 = 3$  $17 \times 0.95 = 16.15$  $2.35 \times 15 = 35.25$ (b) Enzo is given a 10% discount. How much discount will he get? [1] 10% of 63.70 =  $10 \times 63.70 = E6.37$ Jane has £15 to spend. (C) The shop has a special offer on beach balls: 'Buy two get one free' What is the maximum number of beach balls Jane can buy? [2]  $2 \times 3 \cdot 20 = 6 \cdot 40$  (3 balls) 6 balls 2×3·20=6·40 (3balls) 15.00 - 12.80 = E2.20 (no more)

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5	
(e) Here are four cards with numbers on them.	TExaminer only
4 3 7 5	
<ul> <li>(i) Write down the largest four-digit number that can be made by rearranging the cards.</li> </ul>	
7543	
<ul> <li>(ii) Write down the smallest even four-digit number that can be made by rearranging the cards.</li> <li>Only 4 is even - so must be in brits</li> <li>Position</li> </ul>	
3574	
05 © WJEC CBAC Ltd. (C300U20-1) Turn over	r.

C300U201 05

3.	The scales below are used to measure the mass of some fruit in grams.	Examine
	(a) What is the total mass of the fruit on each of the scales? [1	]
	(b) Calculate the mass of each poor and the mass of each because	
	(b) Calculate the mass of each pear and the mass of each banana. Assume that:	
	<ul> <li>each pear has the same mass</li> <li>each banana has the same mass.</li> </ul>	3]
	(P) $870 \div 3 = 90 \text{ g}$ $350 - 90 = 260 \text{ g}$ $\rightarrow 2 \text{ bananas}$ (B) $260 \div 2 = 130 \text{ g}$	
	Pear <u>90</u> grams Banana <u>130</u> grams	
	06	



		8			
. Nine shapes	s are shown below	۷.			Exan on
Sh	ape A	Shape B		Shape C	
				$\bigcirc$	
Sh	ape D	Shape E		Shape F	
				00	
Sł	ape G	Shape H		Shape I	
Complete th	ne following sente	nces.			[4]
Shapes	D and E B has rotation	have only two line	es of <u>symme</u>	try.	
Shapes	A and H	are congruent.	(exactly	the same	)
Shapes	C and G	are <u>simila</u> r but no	ot congruent.	)	
08		Ltd (C2001/20.4)			

6. The table below shows part of a train timetable between Portsmouth Harbour and London Waterloo.

Portsmouth Harbour	06:15	07:14	07:45	08:15	08:45	09:15	09:45	]
Petersfield	06:48	07:45	08:17	08:47	09:17	09:47	10:17	
Haslemere	07:02	07:59	08:31	09:01	09:31	10:00	10:31	
Guildford	07:16	08:17	08:49	09:18 ·	09:48	10:18	10:48	
London Waterloo	07:53	08:56	09:30	09:55	10:29	10:52	11:24	
(a) Elise catches th How long should	e 08:45 tr d her train	ain from F	Portsmout ake?	h Harbour	to Londo	n Waterlo ス۹ +	o. 15 =4	[ 4 r
8.45	9.00	)	10.00	10.2	q		••••••	•••••
					lhe	our 4-	4 min	S
(b) Paul lives in Pet He starts work a	ersfield a at 10 a.m.	nd works	in Guildfoi a tha train	rd.	work			
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time	ersfield a at 10 a.m. minutes to rrive at wo e of the lat	nd works walk fron ork on tim est train f	in Guildfor n the train e. rom Peter	rd. station to sfield he o	work. can take?			[
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time 8:47an	ersfield a at 10 a.m. minutes to rrive at wo e of the lat	nd works walk from ork on tim cest train f	in Guildfor n the train e. rom Peter 9 45	rd. station to sfield he o	work. can take?			[
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time & 47A n	ersfield a at 10 a.m. minutes to rrive at wo e of the lat	nd works walk fron ork on tim cest train f	in Guildfor n the train e. rom Peter 9 45 9 48 A	rd. station to sfield he o ISM AM IOF	work. can take?	ate)		[
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time 8: 47A n	ersfield a at 10 a.m. ninutes to rrive at wo e of the <u>lat</u>	nd works walk from ork on tim cest train f	in Guildfor n the train e. rom Peter 9.45 9.48 A	rd. station to sfield he o ISM AM IOF	work. can take? $\frac{1}{2}m$	ate) 7 //		[
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time 8: 4-7 <i>A</i> n	ersfield a at 10 a.m. ninutes to rrive at wo e of the <u>lat</u>	nd works walk fron ork on tim cest train f	in Guildfor n the train e. rom Peter 9.48 A	rd. station to sfield he c ism Am iOf m Trau	work. can take? $\frac{1}{2}m$	a+e) 7 //		E
(b) Paul lives in Pet He starts work a It takes him 15 r Paul needs to a What is the time 8: 4-7 <i>a</i> n	ersfield a at 10 a.m. ninutes to rrive at wo e of the lat	nd works o walk fron ork on tim cest train f ห	in Guildfor n the train e. rom Peter 9.48 A	rd. station to sfield he o ISM AM IOF M Trav	work. can take? $\frac{1}{2}m$ >8:4	a+e) 7 //		[
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#### Train Times: Portsmouth Harbour to London Waterloo

9



Examiner only



A car hire company in France uses the following formula to calculate costs in euros (€). Car hire cost = €11.25 x number of days car hire + insurance Georgia decides to hire a car for 8 days. Insurance will cost her €95.

Calculate the cost of Georgia's car hire. [2]  $Cost = (11.25 \times 8) + 95$ = €185 Meena is also hiring a car from the same company. (ii) She has €270 to spend on car hire. Insurance will cost her €126. She wants to hire the car for as many days as possible. For how many whole days can Meena afford to hire the car? [3] 270 - 126 = 14412.8 12 days 144 = 11.25 ्रिहाल भाषानुष्



(b)

(i)

Examiner only

Swimming Party	Adventure Centre Panty	
f 320 for 20 children	f13 60 non child	
£7.25 for each additional child.	15% off the total cost for	r.
je	groups of more than 20 children.	
	* <b>*</b>	
A COMPANY OF A COM		
	A CONTRACT OF A	
Special Offer: $\frac{1}{2}$ off the total cost of the party	in the second	
Allik works out the total cost for each party. He chooses the cheaper of the parties.		
A/high party daga Malik shaqqq2		
Swimming Party	dventure Centre Party	
/ou must show all your working.		[7]
Swimming Party 20 children	$\rightarrow$ £320	
+ 5,7,25	-> P 36.25	
· <u>J×1&amp;5</u>	7 L 30 & 3	
Total	£356.25	
Discoupt 1 and tota	E118.75	
3		
· · ·	E23+,20	
$\pm x356.25 = £118.75$		
3		
Adventure Centre Party	<u> </u>	
25× 13.60 =	: <u>E340</u>	
-15%	51	
, 978	2 7 8 C	
	EQOT	
$5 \times 340 = 51$	<u> </u>	
00		





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<b>11.</b> A shop sells the same breakfast cereal in two different-sized boxes.	Examiner only
A Coreal 5009 E2.21 K K K K K K K K K K K K K K K K K K K	
Which box is the better value for money?	5
500g 900g	C 300
You must show all your working. $221 \div 5 = 44.2 p / 100 g$	[2]
$378 \div 9 = 42 p / 100 g B$	
better value	





Examiner only 14. Lynda cycles 31.5 km from home to work each day. > 1.75 hrs One day, her journey to work takes her 1 hour and 45 minutes. (a) Calculate her average speed in km/h. [2] = 18 kmS = D(km)-92649 hrs (b) Lynda cycles home following the same route. She leaves work at 4 p.m. Her average speed on this journey is 15 km/h. At what time does Lynda arrive home? You must show all your working. [4] 31.5 = 2.1 hrsKm. 15 km/h= 2.1 hrs = 2 hrsmins ١ 6.06 pm 4pm + 2hrs 6mins 2 x60  $0 - 1 \times 60 = 6 \text{ mins}.$ mins ms 60 18





(a)	Nathan makes and sells benches, tables and tool sheds. Last year, the profit he made from selling these items was in the following ratio.	
	benches : tables : tool sheds $Total$ 2 : 3 : 7 12	
	(i) What fraction of his profit did Nathan make from selling benches and tables?	[1]
	$\frac{2+3}{12} = \frac{5}{12}$	
	(ii) His total profit was £18072.	
	How much profit did Nathan make from the sale of tool sheds? $7 \times 18072 = 610542$	[2]
	$\frac{1}{12}$	
(b)	Lucy makes and sells planters. Each planter costs Lucy £32 to make. Each one that she sells makes a <b>profit</b> of £80.	
	What is Lucy's profit from the sale of one planter as a percentage of the cost to make the planter?	[2]
	80+32 = Ella selling price.	
	$\frac{\text{Profit} \times 100\%}{100\%} = \frac{80}{200} \times 100 = 250\%$	
	Cost 32 //	
		•••••

midpoint	650	750	850	950
Mass, <i>m</i> (grams)	$600 \leqslant m < 700$	700 <i>≤ m</i> < 800	800 <i>≤ m</i> < 900	900 <i>≤ m</i> < 1000
Frequency	8	7	4	11
Total =(650 = 24 Est mea	(750) -300 n = 2430	(7) + (850)	(4) + (950 ) a //	۲۱ ×۵
(b) Deeta decide She uses the Explain why	es to estimate the r e values 600, 700, her method is unlik سصte will	mean mass of these 800 and 900 rather kely to give a good	e buzzards. than the midpoints estimate of the me	s. an mass. [1] Simate

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## PLEASE DO NOT WRITE ON THIS PAGE



0 Dobbio collecto de	ata about a group of 20 poorte	Examine
<ul> <li>Her data is:</li> <li>the total number</li> </ul>	mber of years for which they have owned a pet of visits they have each made to their doctor in the last year.	
The scatter graph	shows her results and her attempt to draw a line of best fit for the data.	
Number of visits to the doctor		
	Total number of years of pet ownership	
(a) Make a crit The line should b	icism of Debbie's line of best fit. of best fit is too high - there be points above and below it.	[1]
24		

Because there is a negative correlation, owning a pet for longer causes people to need to visit the doctor less often.  Is Debbie correct?  Yes No Explain how you decide.  (1) Come bation does not imply causation it could just be a coincidence.		
Is Debbie correct?	Because there is a negative of longer causes people to need to	correlation, owning a pet for to visit the doctor less often.
Yes No Z Explain how you decide. [1] Correlation does not imply accusation it could just be a coincidence.	Is Debbie correct?	
Explain how you decide. [1]	Yes	No
it could just be a coincidence.	Explain how you decide.	[1
it could just be a coincidence.	Correlation does not	imply causation
	it could just be a	caincidence
	<u> </u>	

I. Jane	t invests £5000 in a	savings accoun	t for 9 years.	ount in this t	imo	
Snei	makes no turther pa	iyments into or o	out of her acc		lime.	
For ti After	this, the interest rat	e decreases to	s 2% compo 1·3% compo	und interest und interest j	per year. per year.	
How	much is Janet's invo	estment worth at	t the end of t	he 9 years?		[4]
	5000 × 1.	$02^{5} =$	5520	. 40		
5	520·40× 1·	$013^4 = E$	5813	• 1 1		
•••••••						
*********						
••••••						
			→×10	300 000	>	
 2. (a)	Circle the correct	conversion of 7	$\xrightarrow{\times i}$ m <sup>3</sup> to cm <sup>3</sup> .	300 DOC	>	[1]
 2. (a)	Circle the correct 0·00007	conversion of $7$	$\frac{1}{m^3 \text{ to cm}^3} \times 10^{10}$	70000	7000000	[1]
	Circle the correct 0.00007	conversion of $7_1$ 0.07	$\frac{1}{m^3 \text{ to cm}^3} \times 10^{10}$	70000	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m	conversion of $\frac{7}{100000000000000000000000000000000000$	$\frac{1}{100} \times 100$	70 000	700000	[1]
2. (a)	Circle the correct 0.00007 $m \times 1m \times 1m$ for $\times 100 cm$	conversion of $71$ 0.07 $h = 1m^3$ × 100 cm	$\frac{1}{100} \times 10^{10}$ $\frac{100}{100} \times 10^{10}$	70 000 70 CCO cn	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m Dem × 100 cm	conversion of $7_{1}$ 0.07 $n = 1m^{3}$ × 100 cm	$\frac{1}{100} \times 10^{10}$ $\frac{1000}{100}$	2000 DOC 70000	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m pcm × 100 cm	conversion of $7r$ 0.07 $n = 1m^3$ $\times 100cm$	$\frac{1}{100} \times 10^{10}$ $\frac{1}{100} \times 10^{10}$	70 000 70 000	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m Dem × 100 cm	conversion of $7_1$ 0.07 $n = 1m^3$ $\times 100cm$	$\frac{1}{1000} \times 10^{10}$	70000 70000	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m Dem × 100 cm	conversion of $7\pi$ 0.07 $n = 1m^3$ $\times 100cm$	$\frac{1}{1000} \times 100$	70000 70000	700000	[1]
2. (a)	Circle the correct 0.00007 m × 1m × 1m Dem × 100 cm	conversion of $7 n$ 0.07 $n = 1m^3$ $\times 100 cm$	$\frac{1}{1000} \times 10^{10}$	70000 70000	700000	[1]



(a	a) Solve	5x + 4 = 2×	2x+6. -2x							[2]	
		3x+2	f = 6								
		2~	+ -+ - 7								
	بر. س	$\frac{3x}{3}$	- <u>a</u> 3					·····	•••••••		
		~	= 2							•••••••	
		س <b>يعل</b> ن	3		[.]	•••••					
(b	) Solve	4x-3> +3	×17. +3							[2]	
	ـــــ	fx >	> 20								
		4	4								
•••••		$\gamma$	> 5								
		$\sim$	<i>~</i>	/		••••••					
(0	c) Solve	the follc	owing sim	ultaneous	s equation 5x - 2y = x - y	ns. Use a = 16 = 5	an algebra	aic (not ç	ıraphical) r	nethod.	
(0	c) Solve You m	the follo	owing simi	ultaneous	s equation 5x - 2y = x - y =	ns. Use a = 16 = 5	an algebra (1) (2)	aic (not ç	ıraphical) r	nethod. [3]	
(u	c) Solve You m	the follc ust sho	wing simi w all your	working.	s equation 5x - 2y = x - y = 25	ns. Use a = 16 = 5	an algebra	aic (not ç	ıraphical) r	nethod. [3]	
(2) โรน	c) Solve You m ) x 5 b (î)	the folk ust sho	wing simi w all your 5x - 5x - 5	working. 3y = 2	s equation 5x - 2y = x - y = x - y = 0 $25$ $16$	ns. Use a = 16 = 5	an algebra	aic (not ç	ıraphical) r	nethod. [3]	
(a 2) S <u>u</u>	c) Solve You m ) x 5 b (i)	the folk	wing similar w all your $5x - 9$	working. 3y = 2 2y = 2 3y = 2	s equation $5x - 2y = x - y = x - y = \frac{25}{16}$	ns. Use a = 16 = 5	an algebra	aic (not ç	ıraphical) r	nethod. [3]	
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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only
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