JUNE 2007 - PAPER 2. SOLUTIONS

3

1. The diagram shows a composite shape formed using three rectangles.



(c) Change 6.4	m^2 into cm^2 .	100 -	l				[2]
6.4m2	= 6.4	100 C	100	3	64000	cm ²	
					ă		[2]

N3 1	2	<u>)</u>			
410 = 11	ાપ	19			
					[2]
The diagram she	ows a number mac	chine.			
		ı r		-	
Input	Add 6		Multiply	Output	
Liput	Auto		by 3		
		J			
(i) Find the l	Input to the numb	$\frac{1}{-6} = \frac{1}{6}$	in the Output is $z - 12$.	-18.	100
(i) Find the 1	Input to the numb $r \div 3 =$	ber machine whe $-\zeta - \zeta$	in the Output is $= -12$	-18.	[1]
(i) Find the l - 12 (ii) Write dow	Input to the numb $7 \div 3 =$ wn the Output from	ber machine whe $-\zeta - \zeta$	in the Output is $z - l2$	–18. e Input is <i>n</i> .	[1]
(i) Find the) - 12 (ii) Write dow	Input to the numb $\dot{r} \div 3 =$ wn the Output fro $+6) \times 3$	for machine when $-\zeta - \zeta$	in the Output is $z - 12$		[1]
(i) Find the 1 -18 (ii) Write doo	Input to the numb $\dot{r} \div 3 =$ wn the Output fro $+6) \times 3$	wer machine whe $-\zeta - \zeta$	in the Output is $= -12$		[1]
(i) Find the] 	Input to the numb $\dot{r} \div 3 =$ wn the Output fro $+6) \times 3$	$- \zeta - \zeta$	in the Output is $z - 12$	-18. e Input is <i>n</i> .	[1]
(i) Find the 1 -18 (ii) Write doo	Input to the numb $\dot{r} \div 3 =$ wn the Output fro $+6) \times 3$		in the Output is $3 - 12$		[1]
(i) Find the 1 - 12 (ii) Write doo	Input to the numb $\dot{r} \div 3 =$ we can be output from $+6) \times 3$		in the Output is $z - 12$		[1]
(i) Find the 1 -18 (ii) Write doo	Input to the numb $\dot{\gamma} \div 3 =$ we can be Output from $+6) \times 3$	per machine whe $- \zeta - \zeta$	in the Output is $3 - 12$.		[1]
(i) Find the] - 1.8 (ii) Write dow	Input to the numb $\dot{r} \div 3 =$ wn the Output fro $+6) \times 3$		in the Output is $= -12$.		[1]
(i) Find the 1	Input to the numb $r \div 3 =$ wn the Output fro $+6) \times 3$		in the Output is $3 - 12$		[1]
(i) Find the 	Input to the numb $\gamma \div 3 =$ we can be Output from $+6) \times 3$	per machine whe $- < - <$	in the Output is $3 - 12$.		[1]

Turn over.

[2]

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[2]

[1]

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	7	Examiner only Arholwr	*		
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(a)	Solve the following equations.				
	(i) $\frac{3x}{5} = 6$			5. (a)	And
	3× = 6×5				(i)
	32=30				
	x = 30 -10				
	3				
	(ii) $4x + 3 = 2x - 5$				2
	4k-(k: -) -)				
	22:-7				
	x=-8=-4		·		
	2	[5]			
	4				(ii)
(b)	Factorise $7a + 21$.				
	$\frac{1}{a+3}$				21
		[1]			
	τ.				
			• 8. ₆₀)
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	, 3 4				
		, t 2.			
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	· · · · · · · · · · · · · · · · · · ·			<i>(b)</i>	Jen
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trew sells his house for £210 000. The estate agent selling the house charges 1.5% on the first £150 000 of the selling price and 2.4% on the remainder. Calculate the total amount Andrew has to pay to the estate agent. 1.5% of 150 000 = 0.015× 150000 = 2.4% of 60000 = 0.024× 60000 = £ Total bill = E3690 Charlie, Mary and Sian buy the house for £210 000. They contribute to the cost of buying the house in the ratio 8:7:5. How much does each contribute? 8+7+5 = 20 ports 210 000 = 20 = +10, 500 per pat hadie pay 8 × 10 goo Mary 7× 10 500 5x 10 500 Charlie contributes £ \$4000 £73500 Mary contributes £52500 Sian contributes [7] ny bougth some jewellery, in a car boot sale, for £25. She sold the jewellery to Alan and de a 30% profit. How much did Alan pay for the jewellery? = 1.3x 25= 32.50 1302

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[3]

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4.



The above diagram shows a trapezium ABCD with AB = 28 cm, BC = 18 cm and CD = 21 cm. Angle $ABC = 90^{\circ}$ and angle $BCD = 90^{\circ}$.

Calculate the length of AD, giving your answer to an appropriate degree of accuracy.

6.

AD 3 An2 = 49+ 324 AD2: 373 AD: cm [5] Turn over. (185-05)

Examiner 10 only Arholwr yn unig 7. A solution to the equation $x^3 - 5x - 34 = 0$ lies between 3.7 and 3.8. Use the method of trial and improvement to find this solution correct to two decimal places. too small 2= 3.75 -0.015625 +0.732 2=3.77 too be 2:3.76 +0.357276 too hu between x=3.75 and x= 3.76 0.17059 ---2h hol 2 2 . •. 21 ks [4]

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investment after 2 years		io por unitaria			
(1.04)	×ba	0 = E	648.	96	
		*		2	6
(a) Write down the n	th term of the	sequence 5,	<mark>4 ц L</mark> 9, 13,	4 17, 21,	[3]
40	+1				
(b) The diagrams sho	w tile pattern	15.			
F F					
Pattern 1 Pa 2 Find an expression	attern 2 6 on for the num	Pattern 3	Pattern n.	Pattern 4	
Pattin 1 + (2+	(3H	(4)+	R,) <u>+</u>
Squard 1, Vilos 2003	4	(9)	202	n ² +1	15
				7	



(185-05)

Examine 13 only Arholwr yn unig 11. The length of a roll of plastic sheeting is 500 cm, measured to the nearest 5 cm. (a) Write down the least possible length and greatest possible length of the roll of plastic sheeting. Greatest possible length 502.5cm Least possible length 497. Fcm [2] (b) A plastic sheet of length 100 cm, measured to the nearest 5 cm, is cut from the roll of plastic sheeting. Find the least possible length of the sheeting left on the roll. Minimum laft = Min Roll legth - Max Cert 497.5-4002102.5 y=-5x = 395 cm. [3] Roundulto record Jan, so measurements could be 490, 491, 500, 505, 510 etc. 497.5 502.5 Turn over. (185-05) (185-05)

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12. On the graph paper below, draw the region which satisfies all of the following inequalities.

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y ≤ 5 $y \ge x - 8$ *x* ≤ 8 $v \ge -5x$







Examiner Examin only Arhoh yn uni 17 18 only Arholwr yn unig Three points P, Q and R lie on the circumference of a circle. 15. Find the standard deviation of this set of ten numbers. (b) The tangent XY touches the circle at R. 4, 8, 7, 3, 5, 6, 1, 9, 5, 4 Find out Р 70 [3] 16. (a) Four points A, B, C and D lie on the circumference of a circle. The lines AC and BD intersect at the point F. Diagram not drawn to scale. Given that $\widehat{RPQ} = 70^{\circ}$ and $\widehat{PQR} = 68^{\circ}$, find the size of \widehat{PRX} , giving a reason for your answer. [2] Diagram not drawn to scale. Given that $\overrightarrow{AFD} = 45^\circ$ and $\overrightarrow{BDC} = 20^\circ$, find the size of \overrightarrow{ABD} giving a reason for your answer. BAR = BOC = 20 (Rabbits GAND) BEA = 180-45 = 135 (struct (ine) ABD = 180 - 20 - 45 = 25° (Anybin a 2) (185-05) Turn over. (185-05)

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17. The diagram shows a trapezium.



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[1]

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Turn over.

The parallel sides of a trapezium are of lengths 10 cm and (2x - 3) cm. The height of the trapezium is (4x + 6) cm and its area is 70 cm².

Show that $4x^2 + 20x - 49 = 0$ (a)=70 +10 ×2 12x+28x+42 -140:0 4x + 10x - 49 =0 [3] C=-49 a=4 6:20

(b) Use the quadratic formula to solve the equation $4x^2 + 20x - 49 = 0$. Give your answers correct to one decimal place

-4x 10 400 + .6.8 0-1184 = -20+ 11 [3]

(c) Hence write down the height of the trapezium. 12.2 cm +6 3 4×1.8

18. An international clothing manufacturer employs people in Peru, Mexico, Finland, Thailand and Vietnam.

20

The number of people employed by the clothing manufacturer in each country is given in the following table.

Country	Number of employees	
Peru	564	1
Mexico	346	
Finland	320	7+=68
Thailand	2130	-
Vietnam	3450	

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The clothing manufacturer is arranging a fashion show and decides to invite a total of 18 employees to represent all the employees in the five countries.

Use a stratified sampling method to calculate how many people from each country should be invited to the fashion show.

era Maxico = 346 x 18 5 0 Inland = 320 18:0 2130,185 2.6 6 10 6 6810 X cant have [4] regative

22 Examiner only Arholwr yn unig Examinonly Arholw yn uniş 21 20. The diagram shows triangle ABC. 19. You are given that JL = 3x + 2y, LM = 5x - 2y and MN = 20x - 8y. (a) Express JM in terms of x and y in its simplest form. TM = TL+LM = 3x+2y + 52-2y = 8x Area = $42 \cdot 6 \text{ cm}^2$ 72° Aren-165int 6.2 cm C 6 [2] Show that LN = k LM where the value of the constant k is to be found. (b) (i) R = LM + MAN = 5x - 2y + 20x - Fy = 25x = 10y = 5(5x - 2y) but LM = 5x-24 LN= JLM [1] С Diagram not drawn to scale. (ii) What can you say about the points L, M and N? strua 10 01 a Given that $\overrightarrow{BAC} = 72^\circ$, $\overrightarrow{AB} = 6.2$ cm and that the area of the triangle \overrightarrow{ABC} is 42.6 cm², find \overrightarrow{BC} . [1] Sin 72 × 6.2× Ner 3 42.6 xbx JintL 14.4 cm 6: Sin72 [6] (185-05) Turn over. (185-05)