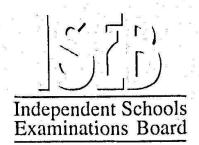
SURNAME	FIRS	T NAME	·····			
(Block capitals, please)			a #	8	yi	75
ILINIOB SCHOOL	SEN	IOB SCHOOL	77		, 100 to	- 341



COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

PAPER 4: Calculator Paper

Practice Paper 2006–2007

Please read this information before the examination starts.

- This examination is 60 minutes long.
- All questions should be attempted.
- A row of dots denotes a space for your answer.
- Where answers are not exact they should be given to three significant figures, unless specified otherwise.
- The π button on your calculator should be used for calculations involving π .

	100	*		e # 12	*	th the same and th	54.2		e •	2 2	* ************************************	¥ w	1 N R	Ģ.
				10		(2.64	54.2 + 3.12	(5) ³	10 10	8 2	€E A€		8 2 8	
	£	2 2	10 10 10	26 26	W	70	25 25 25	16 16					16 S H	
a 8	120	84 84 85		- 17 - 17	*		16	3 8	(4)	60 09	10 St	N At		
26		* 15	W 76		8	2 3	8	: 2 :: :::		20 S	. z		1	
18	# # # # # # # # # # # # # # # # # # #	18 76	8		eris S		a 2	n , o	176		10	2 0		
	± € 2	e s	201	s x	ia 28	8 9	2 2	18 16	2				8	
22		8	8	15		S 76	9		8 8 8	92 92	45 45	@##	8	10.
	Ř	×)E	8	27		į.	gi o		B (2)	20 21 22 21 21 22 21 22	15 W	W 22	*
	(5)	W	n ^v a	Ø	8 %	2	y s	2 * 2	¥.	8 M 500	er.	8.8	# #	
	10	10° 20	2 N _S	W (6)		a		n 8	; st	8 E N	Wa .	iso Ti Si		20
	22				32	15°-1	Ans	wer:						(2)
		- 39	ii.	×	æ	22			9) 9) (4)			2	10 76	J. se
	7::5	117.	24 C 20020	9	8 <u>.</u> .			5 10 55	18	2	At News	s s		
p:	(11)	wnte	your	answe	er to p	art (a) (i) co	rrect to	o 3 de	cimal	place	s.	8	2 2 2
			2	25		일	81 S 89	38.	2/ 1/	a to	18 O 18	29	2 K 4	
2	20	9 2		16	93	s **	2 2	텧	281	90 II	10 10 10 10 10 10	9 9	87 80 80	
23 25		18			09	15 20	Ansv	wer:	• • • • • • • • • •	*******	*******	• • • • • • • • • •	•••••	(1)
n s	2000		20	84 1	2 1201		W.	0823	ii.	8	2 ⁸² . 81	21 (22) 18 (1)	€ 8	155 166 167
(b)	(1)	Writin	g dov	vn all t	he fig	ures s	shown (on you	ır calcı	ulator,	find t	he va	lue of	
			*			15	4 00	02	55 5765 36	2 #	2 2	**************************************		
왕				is.	37.	V15.	4 – 3.8 51.6	8	•			8 00 8.		: :a
8	- 8				09	W 76	0.10	92	W (4)	•			70	e e
	2	10	96	50 g			·				37	S 84	2 ²⁰ 20	20
	er e		S.	# #		8	8	2 F					©.	8 8 8 8
		N o		76				20 22	2 14 2	8		10	* * * *	22
^		24			da da	14	5 Ø	di	8		8	×	3(5
		9		22		94	26 H H	175			8	92	78	
		th.	35 88	8					25					
	## ##		187 186		W	**	*	.ee	5	At			W	
8	72	72					e e						16	
er Si		0.	g.	×	130		A	9	;	g th E	¥2 5¥	138		
					8		Ansv	ver;		*******	*******	••••••		(2)
	700		201				76	9		27	×	Įģ.		
9	(iii) V	Vrite y	your a	answei	r to pa	art (b)	(i) cor	rect to	2 sia	nifica	nt fia	iron	n	
v .	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	22	•	*	•	2 T		un transportation (0.9	·····ca	in ligi	JI 62.		
		a)									8			
×		31	Xc				Ansv	ver:			76 80	39		/41

t. (a) (i) Writing down all the figures shown on your calculator, find the value of

	£120. He fir discount.	ids a shop tha	dy-made board cost at will give him a 15	5%	3
* * * * * * * * * * * * * * * * * * *	How much d	oes Julian spe	nd on his new skate	board?	
8				# E E E	
es ²					
		N N N N N N N N N N N N N N N N N N N		7 M 18 M 1	(0)
			Answer: £		(2)
* * * * * * * * * * * * * * * * * * *				W. W. W.	
(i	i) Harry decide	es to build his o	own. He needs a dec	ck, a set of	trucks and
* * * * * * * * * * * * * * * * * * *	4 wheels.			* ************************************	
		deck	£60		
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	set of trucks	£24		
		wheels	£4.50 eac	<u>h</u>	e e e e e
× ×					aved prices.
	Harry finds	a shop that will	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry		ـــا ff the displa	ayed prices. or his new
	Harry finds How much skateboard	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	ayed prices. or his new
	How much	a shop that will does Harry	give him one-third o	ـــا ff the displa	or his new
	How much skateboard	a shop that will does Harry s	give him one-third o spend on buying the	ـــا ff the displa	or his new
(b) II	How much skateboard	a shop that will does Harry s	give him one-third on spend on buying the Answer: £	ـــا ff the displa	or his new
Те	How much skateboard bought a mode en years later	a shop that will does Harry s ? ern painting for I sold the paint	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new
Те	How much skateboard bought a mode en years later	a shop that will does Harry s	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new
Те	How much skateboard bought a mode en years later	a shop that will does Harry s ? ern painting for I sold the paint	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new
Te	How much skateboard bought a mode en years later	a shop that will does Harry s ? ern painting for I sold the paint	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new
Те	How much skateboard bought a mode en years later	a shop that will does Harry s ? ern painting for I sold the paint	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new
те	How much skateboard bought a mode en years later	a shop that will does Harry s ? ern painting for I sold the paint	give him one-third of spend on buying the spend on buying the £1600 for £4000	ـــا ff the displa	or his new

3. (a)	Simplify		2 2 2 2 2 3				e e	æ
4 a a	(i) $4n^2 - 6n - n^2$		2 4		* a s	8 8 8		
差		8 8 8 8		A B			*****	(1
2 a		Ansv	ver:		(E)	8 8		9
	(ii) $(3n)^2 \times n^2$		a 18	20 (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	* * * * * * * * * * * * * * * * * * *	2	×	
e ^r		Ansv	vor					(2
# #		VIIO	VC)	8/	N N	<i>2</i> 4	40	9
g g	(iii) $\frac{12n^2}{20n^3}$			8 8	# # ## ## ## ## ## ## ## ## ## ## ## ##	26 E	a	
12 (12) 16 16		Answ	ver:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		*	(2
a a		e S	\$ N		a e	35 X	55 35 30	
(b)	Multiply out the brackets and sir	nplify	# 8 #	40	10 (10) 14 15 (1)		(*)	
w. ©	4b(2a-3)-3a(b+3)	**************************************	20 26 26	35 F. 10	я 28		が (2) (2) (3)	
æ	a a	e S	®	16 26	26 No. 100 No.	35 St. 25	\$8	
10 35 10 10		*	8	9 2	# # # # # # # # # # # # # # # # # # #	W St.	20° 25.	

Answer:(3

(c) Factorise completely $18ac^2 - 12a^2c$

Answer:

2	(i) $4 - a = -16$	2 2 2 4 2 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4		W
20 20 20 20 20 20 20 20 20 20 20 20 20 2		× .		
8 %		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
" " " " " " " " " " " " " " " " " " "	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	10 00 10 10 10 10 10 10 10 10 10 10 10 1		
2 8			2	5 (c)
W	a 3 × 2	Answer: $a = 1$		(1)
e ²³		2 N N N N N N N N N N N N N N N N N N N		18 8 18
8 8 8 8 8	(ii) $\frac{2}{3}b + 2 = 14$	z a ^a o	* * * * * * * * * * * * * * * * * * *	**
	, , 3 · · · · · · · · · · · · · · · · ·	e s		2 2 2
				3 P
				n n
				* * * * * * * * * * * * * * * * * * *
		Answer: $b = 1$.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(2)
** z	a			
	(iii) $3(4c+2) = 10 - 4(c-1)$	2)		5 K
9 K E				# #
æ		a a		N
	и 2 и _м	8 8 8		a 22
		Answer: c =		(3)
At	a a	Ø Ø		a,
(b)	(i) Solve the inequality	48 - 12d > 3		# # # # # # # # # # # # # # # # # # #
		* 8 a		
	В — — — — — — — — — — — — — — — — — — —			8
8		a		9
a a a o	о на _и		50 St. 100 St.	
		2 4 4 N		
		Answer:		. (2

5.	of personaut.	the Goat is the nal freedom, h	o runs round t	ho post in a	Circular be			- 8 2
	20 20 3						a e	ж
					m -)		e ²	**
8	(i) (a)	Find the circu	umference of (Grumble's ci	rcular path		,	at at
a nd	2 Z	a gr a		a a a			g g	
18 18 :				Answer:			m	(2
54	Gru	umble complet	es 100 circuits	of the path.	e o st	8 8 8 W 8	a a	
	(b)	Find the tota	l distance trav	elled by Gru	mble in kild	metres.		
	8		F 10	*	ж.	6 8 10	*,	91 2021 30
60	e e			Answer:		e e	km	(2)
	Grı	umble's run las	sts 40 minutes	e	*		a a	16.
	₩.	Find Grumbl	a **		etres per h	our.	**************************************	2
æ:	s • • • •	e		v.	5	4 ₂ ×		1 2 2 76
	## ## ## ## ## ## ## ## ## ## ## ## ##		8 18 20	Answer:	***************************************		km h	(2)
	Realisir can rea	ng that this has	s had no effec	t, Grumble d	lecides to e	eat all the	grass he	9 33
,		liculate the area	a of grass eate	n, giving you	r answer to	the neare	st 10 m².	% S
			\$ 5 \$		5		20 20	
		e e	* *	Answer:	8	10 10 10	m²	(2)

6. (i) If $y = 1 - \frac{1}{2}x$ complete the table of values below.

X	-3	0	3
у	я е	81	8

(2)

(ii) On the grid below, draw and label the line $y = 1 - \frac{1}{2}x$

(1)

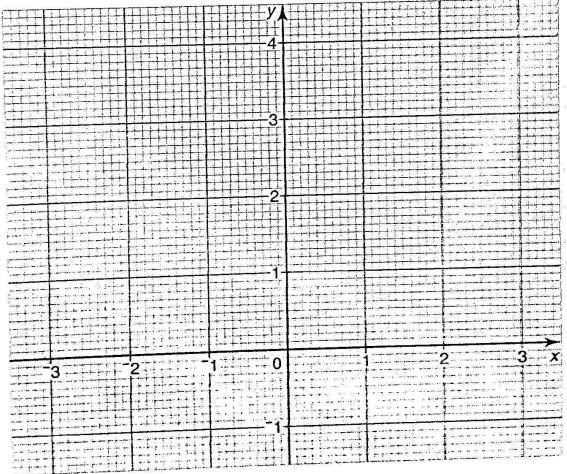
(iii) If $y = \frac{1}{2}x^2 - 1$ complete the table of values below.

			No. of the second				
x	-3	⁻ 2	- 1	0	1	2	3
У			- <u>1</u>	tii		1	

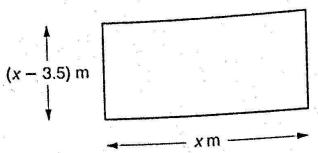
(2)

- (iv) On the grid below, draw and label the curve $y = \frac{1}{2}x^2 1$ (2)
- (v) Write down the coordinates of the points of intersection of the line and the curve.

Answer: (.....) and (.....) (2)



7. A rectangular room is x metres in length. Its width is 3.5 metres less than its length.



not to scale

(i) Write an expression, in terms of x, for the area of the room.

		2	
Palit	***************************************	m²	(1)
Annuar		 	1.1
Allswei.	******	 s &	

The area of the room is 32 m².

(ii) Using a trial-and-improvement method, find to the nearest 10 cm, the length of the room.

The table below should be used to record your working.

x		x - 3.5	9	area
		II.		
w W W	8 8			
				g
2 2		3 2 5 F		
2		a a	a	

Answer:
$$x = \dots m$$
 (4)

(iii) Use your answer to part (ii) to calculate the perimeter of this room.

Answer: ____ m (2)

- 8. Milly (M) and Zoe (Z) are looking for buried treasure. Zoe is standing 20 metres away from Milly on a bearing of 050°.
- (i) Using a scale of 1:200, plot Zoē's position (Z).



Captain Flint tells them that if Milly walks on a bearing of 080° and Zoë walks on a bearing of 125°, their paths will cross at the treasure.

- (ii) Draw their paths on the diagram, and mark the position of the treasure (T). (3)
- (iii) How far does Milly walk to reach the treasure?

Answer: m (2)

(iv) If Milly walks at 2.5 m/s, how long does it take her to reach the treasure?

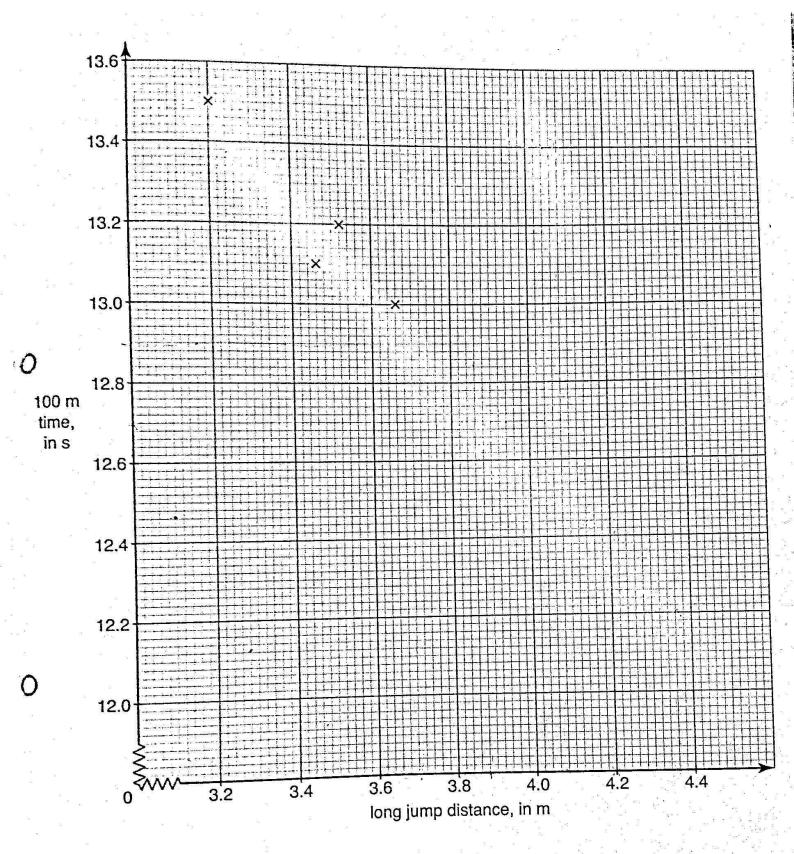
Answer: s (2)

Here are the results of 10 children who took
part in the long jump and the 100 metres race in a
recent athletics competition:



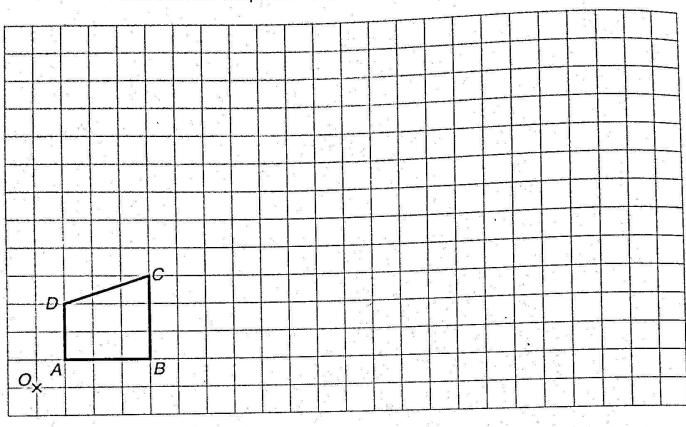
		SF.	316 377—22—————————————————————————————————					1 1		
long jump distance, in metres	3.20	3.46	3.52	3.66	4.20	3.80	4.04	4.02	3.88	4.36
100 m time, in seconds	13.5	13.1	13.2	13.0	12.4	12.8	13.4	12.7	12.7	12.2

on time, in seconds	<u> </u>
The first four pairs of results have been plotted on the grid opposite.	
	(2
(i) Plot the remaining six pairs of results on the grid opposite.	(3
(ii) Circle the point on the scattergraph which seems to be out of place.	(1)
(iii) Ignoring the point which is out of place, draw the line of best fit.	(1)
(iv) What sort of correlation is shown by these results?	* 5
Answer:	(1)
	W. M. Sept.
(v) Who jumped further in this competition – fast runners or slow runners?	
Answer:	. (1)
	• (1)
Ed sprained his ankle after jumping 3.70 metres in the long jump.	
(vi) Showing where you take your reading, use your line of best fit to predict the time Ed would have taken in the 100 metres race, to the neares hundredth of a second.	t t
	20 (20 (20 (20 (20 (20 (20 (20 (20 (20 (
N=	
Answer:s	(2)



10. (a) (i) With centre O and scale factor 3, draw the enlargement of ABCD.

Label the new shape A'B'C'D'.



(ii) AB is 3 units long. What is the area of shape A'B'C'D'?

Answer: units² (2)

(2)

(b) I enlarge shape P into shape Q.
 Shape P has an area of 9 units².
 Shape Q has an area of 144 units².

(i) What is the scale factor of the enlargement?

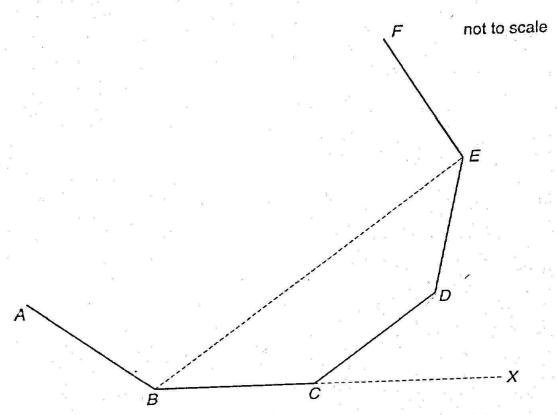
Answer:(2)

The perimeter of shape Q is 50 units.

(ii) What is the perimeter of shape P?

Answer: units (1)

11.



ABCDEF is part of a regular nonagon. BC is extended to X. B is joined to E. Calculate the size of

(i) angle DCX

Answer: (2)

(ii) angle BCD

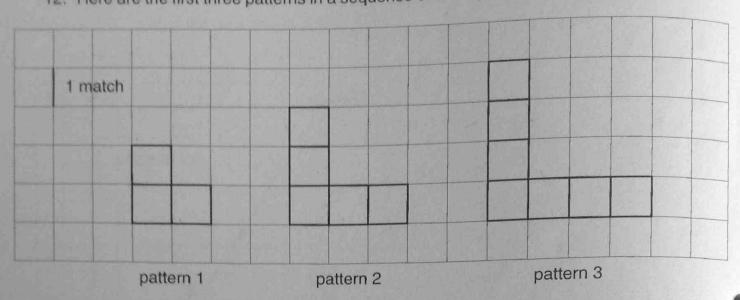
Answer: (1)

(iii) angle ABE.

Answer: (2)

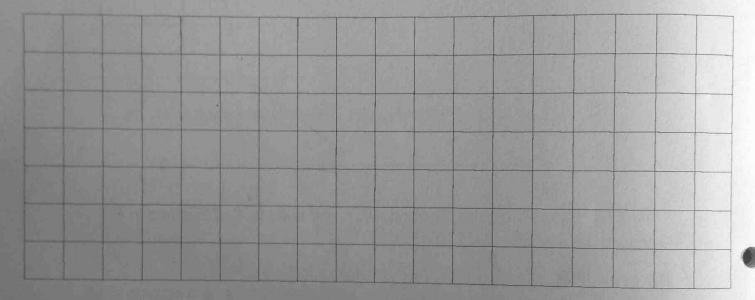
Turn over

12. Here are the first three patterns in a sequence of L-shapes made with matches:



(i) Draw pattern 4 below.

(1)



(ii) Complete the table for patterns 1 to 4

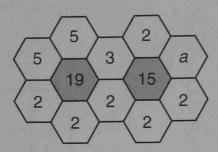
pattern number	1	2	3	4
number of small squares	3			
number of matches on perimeter	8			
number of matches in total	10			

(3)

16	(iii)	How many s	small squa	ares are	there in	pattern	10?		8 8 21 21	81
2 2 2	2	a a a	er e		ar ari	27 47 51		a a	a T	is is a second of the second o
25 E	#1		á	8 8	製	≈ × ≈ §	100	8 g h	.	
11/2 2002	N:	a a	* *		*** **		a	**************************************	a 5	W e
\$5. I	Va.	e e		а У Я		a w	g (C)	a	W N	# # # # # # # # # # # # # # # # # # #
8	2	©.			Ans	swer:		**************************************		
8	(iv)	How many Give your a	matches in	n total ar	e there i	n the nt	h patter	n?		100 TO
20	R	Cive your o	and the t		e e	M. gs.				7 (5) 2 (5)
n n ;	e ^{sti} er	2 0			遊		8 S		at	× 7
*		u u		8	s	8	8	Si.	s *	94
्य स		10. 13. 14.		2	8 A A A B	æ ss	166 SF			3,
8	8.8	a a	so e	al a	Λno	swer:	· 8			
	s n	8	is and the second secon	is 58		9			2 1	
3 2 3 2	(v)	If I use a matches wi	total of 12 Il be on th	24 match e perime	es to m ter?	ake a s	imilar, L	-snape	, now i	nany
海 章		n "n	25 35 30	9	2 2		a 18	8	a 3	13 18
	9	2 2	10 M H	. <u> </u>	e a	25 M W W	ž.	34 80 80 80 80 80 80 80 80 80 80 80 80 80	2 E	# W ₂₂
90 ys 12	W 481	2 2 2	5 B	2 2	8	8 8		8	a ^e n s	. W
	#E 50	E SES	e ²	**************************************	20	24 32 60		2 2 2		
я	*		e #	81 t	Ans	swer:			***************************************	
					15		#h	70		Turn ov

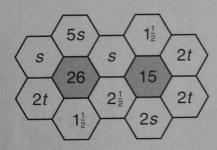
S.A. 2538128

13. The six numbers round a shaded hexagon add up to the number inside it.



(i) Calculate the value of a.

(ii) Using the diagram below, write down two equations, in terms of s and t, and solve them simultaneously to find the values of s and t.



$$t = \dots$$
 (4)

(Total marks: 100)