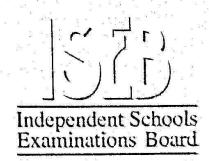
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COMMON ENTRANCE EXAMINATION AT 18-

MATHEMATICS

PAPER 4

Calculator Paper

Tuesday 6 June 2006

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 ligures, unless specified otherwise.
- The π button on your calculator should be used for calculations involving in.

I. (a)	(i) Writing down all the figures shown on your calculator, find the value of	# ₂₀ 8
16	14.2 + 1.75	At an
1	6.31	
8 S	Answer:	(2)
) a *	Answer	
22	w a cignificant figures.	76
.e .e	(ii) Write your answer to part (a) (i) correct to 2 significant figures.	Angle An
	Answer:	(1)
()		3 3 5 8
	(iii) Write your answer to part (a) (i) correct to 3 decimal places.	
	Answer:	(1)
a		1405
(b)	Consider the expression	***************************************
(-)	6128	8
	$\frac{0120}{9.7\times18.3}$	
**	(i) (a) Write each number of the expression correct to 1 significant	3.5
	figure.	8 2 A
8	Answer:	(2)
E		10 20 10 47
W SI	v v Controllete vegus appropria part (b) (i) (a)	
	(b) Calculate your answer to part (b) (i) (a).	* *
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	Answer:	(1)
th. St	Allower, damain, and an arrangement of the second of the s	1.1
N.	(ii) Giving your answer correct to the nearest whole number, evaluate	8
		@
	6128 9.7 × 18.3	is
		(0)
	Answer:	(2)

		Answer: £	
(ii) Peter sell	s the shares for £3186		
(a) How	much profit does he ma	ake?	
	30 to 30		
		Answer: £	
(b) By h	ow much has each sha		
- A 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000	ow much has each sha your answer correct to	re increased in value?	
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(iii) Helen sp 371½ pen	your answer correct to ends £1783.20 buyin ce each.	re increased in value? the nearest penny. Answer:	when they cos
Give (iii) Helen sp 371½ pen	your answer correct to	re increased in value? the nearest penny. Answer:	when they cos
Give (iii) Helen sp 371½ pen	your answer correct to ends £1783.20 buyin ce each.	re increased in value? the nearest penny. Answer:	when they cos

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3	(a)	The ingredie	ents need	ed to mak	e 12 scon	es are	2		-}
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to to 00		Find the ing	redients r	needed to	make 18 s	scones.		*	$u_{_{_{\rm Y}}}$
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35	a a	e a a	a	# # # 5		Duto	71		7.7
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×	8 8		# ** **		2 2 E				(8)
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	(b)		10	- ED	* 4 * * * * * * * * * * * * * * * * * *	e ratio of 2:35		th as as a	10 (10 (10 (10 (10 (10 (10 (10 (10 (10 (
		(i) What is	the num	ber of pig	s on the fa	rm if there are	175 hens?		
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	8		# 12	⊛ ¥/	is in				
	22	(ii) Farmer	r Archer s	ells 4 pigs	3.	· · · · · · · · · · · · · · · · · · ·		* # *	5
	<i>1</i> 6	How m	any hens	must be	sold to kee	p to the origina	al ratio of 2:35	?	Nt.
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			91	ās)E	\$	8	500 E	is E
		e a			8 8	10	*	8	35 3+ 33
Q	At	9	æ		组	Λ π σ	8 8		(0)
		e 2	* s'	*	\$ a	Answer:	*****************		(2)
		<i>n</i>	2	5	23				
	(c)					re in the ratio o	of 4:5:6	(4)	
W ₁	, e	What is the	size of th	ne largest	angle?	At .	£		
		8	8	Jet.	e e	# # # # # # # # # # # # # # # # # # #	×		
E.	10	9			2	81 N B	wi	37	
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60	\$6		s e			wilemet: """	*****************		(2)
						of the second se			

4. (a)	Next term the number of pupils w		
	How many more pupils will there		
	(10W Marty More public will there		
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			35
			8 8
			n s
			10 M 20 m
357 AV			. W .
		Answer:	(2)
		Allower.	
		ill have degraded from 90 to 76	12 100 11.
(b)	By what percentage will the number	will have decreased from 80 to 76	* * * * * * * * * * * * * * * * * * *
	by what percentage will the number	Ser of Standard Coordinate	
			N N N N N N N N N N N N N N N N N N N
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94 25 34 25 32			2 T
S 2		Answer:95	(2)
10 E			
# [4]			
	ow long does it take to travel 1800 r		a se
Gi	ve your answer in minutes and seco	onds.	. H . H . S
(g)			
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92			
			9 N
N 2			14 2 2 2 2 3
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			(3)
8	(A)	Answer: min sec	10)

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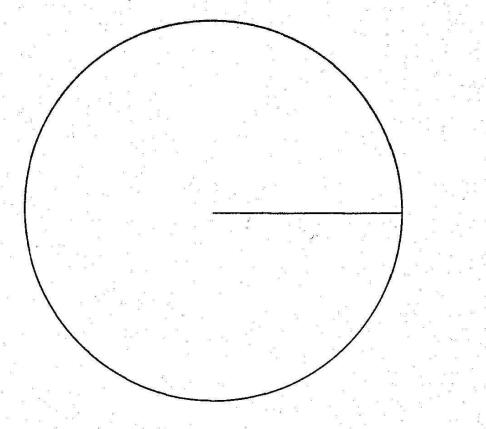
Turn over

s ,			a	z z z	20 20 20	27
6 Ali etande	e outside his schr	ool to record the nun	nber of	people in the	cars which	
pass mm	during a 20-min	ate portour		S 88		ন
His result	s show the total	number of people in	eacirc	1 2		727
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Ali record	ls his results on a	a tally chart.	8 W W	и к 2 8 g	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	8
33	the chart.		at de	a a		8
u u u	number of people in a car	tally	e : : : : : : : : : : : : : : : : : : :	frequency		
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es at	()		total			(2)
Use the c	hart to find	2 4		e *	9	120
a	1/4	people in each car		, N ^E	ж ж	6 N
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(iii) the m	nean number of p	people in each car	6	2 2		25 25
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10 E		* * *	Ansı	wer:		(1)
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ir.

All wants to display the information shown in the tally chart. He decides to use a pie chart.

(v) Draw the fully-labelled pie chart.



(vi) Using the data from the tally chart, estimate the number of cars, each containing 2 people, which would pass Ali during a 2-hour period.

2 St					
Answer:	8 S			12 12 March	111
WIIDMEI.		**********	***********		111

S.A. 2836328

(4)

		2000000 00000	
	(a)	Solve	
7.	1311	SOIVE	1
	100	~ · · · ·	•

(i)
$$\frac{p}{4} = 4$$

Answer: $p = \dots (1)$

(ii)
$$5q - 3 = 3q - 9$$

Answer: q = (2)

(iii)
$$\frac{2}{3}(2r-3)=6$$

(b) Solve the inequalities

(i) $3x - 4 \le 26$

Answer: (2)

(ii)
$$17 - 2x < 2$$

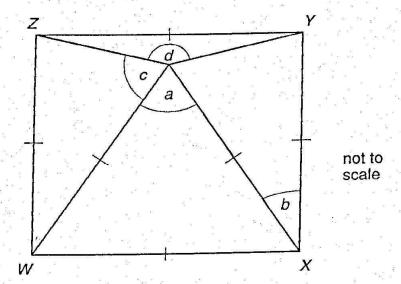
Answer: (2)

(iii) What are the integer values that satisfy both the inequalities in parts (b) (i) and (ii)?

Answer:(1

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8



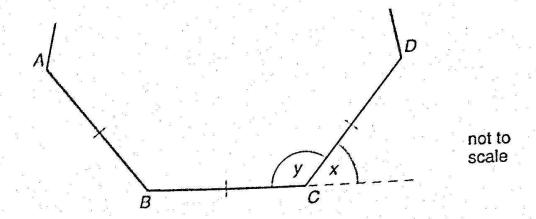
WXYZ is a square.

Calculate the size of each of the angles marked a, b, c and d.

Answer: c = (2)

Answer: $d = \dots (2)$

0.



A, B, C and D are vertices of a regular polygon.

The cize of an interior angle, y, is three times the size of an exterior angle, x.

(i) Calculate the size of an exterior angle.

			•	18 magazin
Answer:	 	 	•••	(2)

(ii) How many sides does the regular polygon have?

(iii) What is the sum of the interior angles of the regular polygon?

10. (a) A map has a scale of 1:50 000 How many centimetres represent 1 kilometre?

Answer: cm (2



Adam runs a triangular orienteering course. He sets off from school (S) and runs north-east for 4 km to a monument (M).

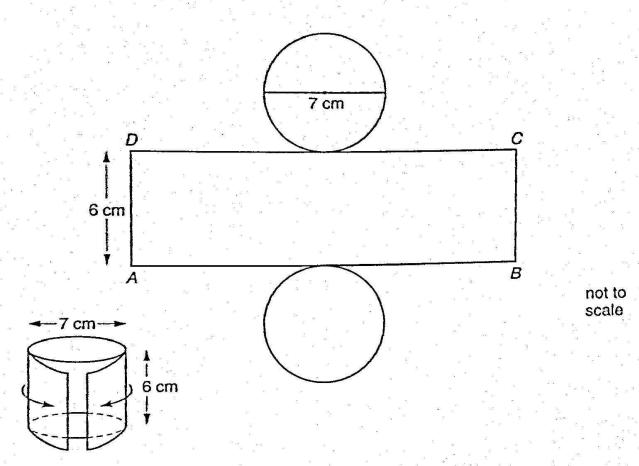
- (i) Using a scale of 1:50 000 find and mark the position of *M*. (2)
 On the second leg he travels 2.5 km from *M* on a bearing of 125° to a telephone box (7).
- (ii) Find and mark the position of *T*. (2)

 Adam then returns directly to school.
 - (iii) How far is it from the telephone box to school?
 - Answer: km (2)
 - (lv) What is the bearing of S from T?
 - Answer: (2)

11

Turn over

11.	(i)	A ci	rcle ha	s a di	amete	er of le	ngth 7	centi	metr	es.	m .		30 at 30	2 a	¥
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8	(ii)	Th	e diag	ram o	pposit	te shov	ws a i	net for	mal	king a	smal	l cylin	drical	tin of	%
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(b) Calculate the area of metal needed to make this tin.

Answer: cm² (2)

(c) Calculate the volume of this tin.

Answer: cm³ (2)
Turn over

13

12. (i) When $y = x^2 - 2x$ complete the table of values

X	-2	-1	0	1	2	3
x ²				1		
-2x		2			-4	
У					0	

(3)

(2)

- (ii) On the grid opposite draw and label the curve $y = x^2 2x$
- (iii) When $y = 4 \frac{1}{2}x$ complete the table of values

X	-2	0	2
у			

(1)

- (iv) On the grid opposite draw and label the line $y = 4 \frac{1}{2}x$
- (1)

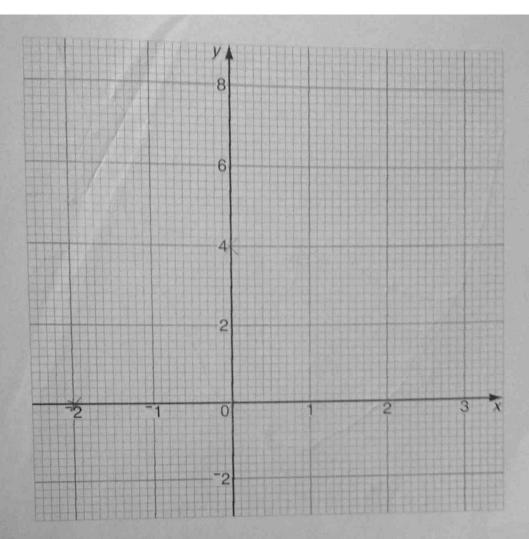
(v) Where the graphs cross,

$$x^2 - 2x = 4 - \frac{1}{2}x$$

(a) Show this equation can be written

$$2x^2 - 3x - 8 = 0$$

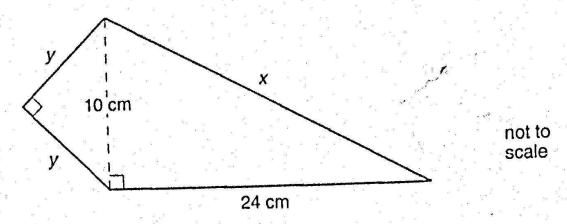
(2)



(b) From your graph, read off the negative value of x which satisfies

$$2x^2 - 3x - 8 = 0$$

13.



A company logo is formed of two right-angled triangles as shown in the diagram.

(All measurements are in centimetres.)

(i) Calculate the length x.

Answer:
$$x =$$
 cm (2)

(ii) Calculate the length y.

Answer:
$$y =$$
 cm (2)

(iii) Calculate the perimeter of the logo.

(iv) Calculate the area of the logo.

Answer: cm² (3)

(Total marks: 100)