FORMULAS FOR REFERENCE

SPHERE Surface area =  $4\pi r^2$ 

Volume  $= \frac{4}{3}\pi r^3$ 

CYLINDER Area of curved surface =  $2\pi rh$ 

Volume =  $\pi r^2 h$ 

CONE Area of curved surface =  $\pi rl$ 

Volume  $= \frac{1}{3}\pi r^2 h$ 

PRISM Volume = base area  $\times$  height

PYRAMID Volume =  $\frac{1}{3} \times \text{base area} \times \text{height}$ 

Page	total
. 450	LOTEL

SECTION A(1) (33 marks)
Answer ALL questions in this section and write your answers in the spaces provided.

Make $m$ the subject of the formula $mx = 2(m+c)$ .	(3 ma
	JANUARA MARKATANA
	//·/A—/
Find the range of values of x which satisfy both $\frac{3-5x}{4} \ge 2-x$ and $x+8>0$ .	(3 ma
	MENNING PROPERTY AND THE PROPERTY OF THE PROPE
	······································
Factorize	
(a) $x^2 - (y-z)^2$ ,	
(b) $ab - ad - bc + cd$ .	(3 ma
	(5 III

Page	total

		***************************************
		A
		· · · · · · · · · · · · · · · · · · ·
A hai	ndbag costs \$ 400. The marked price of the handbag is 20% above the cost. It is sold at unt on the marked price.	ta 2
(a)	Find the selling price of the handbag.	
(b)	Find the percentage profit or percentage loss.	
(b)	Find the percentage profit or percentage loss. (4	ma
(b)	Find the percentage profit or percentage loss. (4	ma
(b)	Find the percentage profit or percentage loss. (4	ma
(b)	Find the percentage profit or percentage loss.  (4	ma
(b)	Find the percentage profit or percentage loss.  (4	ma
(b)	Find the percentage profit or percentage loss.  (4	ma
(b)	Find the percentage profit or percentage loss. (4	A sh
(b)	(4	A sh
(b)	(4	A sh
(b)	(4	A sh
(b)	(4	A sh
(b)	(4	A alla
	(4	A sh
	(4	A sh
	(4	A sh
(b)	(4	A she
	(4	· ma

Page	total
use	wiai

600 ticke sold. If the	only two kinds ts are sold. The ne price of a fin oney for the tick	st-class ticket is	s \$850 and that of	of an economy-cla	iss ticket is	500 , find : (4 mar)
III III III III III III III III III II			III MARINI WAARAA WAA AA		e en	
		HIJAAHARAI AAAAAA ARRAANAA HIJAAAA		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	O THE OWNER OF THE OWNER OWNER OF THE OWNER	
	NAVATO A PARA PARA PARA PARA PARA PARA PARA P	THE STATE OF THE S	HINDON AND THE STATE OF THE STA		MANUFACTURE CONTRACTOR OF THE	
-/		AND THE RESERVE OF THE PROPERTY OF THE PROPERT		WILLIAM WAS THE PROPERTY OF THE WILLIAM WAS THE WILLIAM WAS THE WAS TH		
-WARRIE BERTHANDEN						
		INDURANTI BERTARAN KANTAN K	ngasan wanan mare engin sa sebid Masan Manan Alland	HARAINASEAHINASIANANANANANANANANANANANANANANANANANA	WILLIAM TO THE TOTAL THE TOTAL TO THE TOTAL THE TOTAL TO THE TOTAL TOT	J
		NAMOUNIAMONA PARTE TAMOUNIAMONA PARTE TAMOUNIAMONA PARTE TAMOUNIAMONA PARTE TAMOUNIAMONA PARTE TAMOUNIAMONA PA		NUMBER 11100 PER		
		THE OF THE PROPERTY OF THE PRO	***************************************			2000
Was	NAVIVASAII IANAAA IANAAA AA A	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	MANAMAN		BAIRWANDANDANDANDANDANDANDANDANDANDANDANDANDA	
III III III III III III III III III II		мания виделина прич	INTERIOR DE L'ANNOUS PAR L'ANNO	\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
	the arithmetic so	equence 2, 5,	8, Find			
(a) the	: 10th term of t					(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar)
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar
(a) the	: 10th term of t	his sequence,				(4 mar

8. Figure 1 shows a parallelogram ABCD. The diagonals AC and BD cut at E.

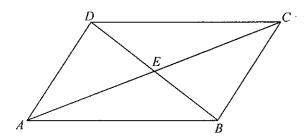


Figure 1

(a) Prove that the triangles	ABC and	1 CDA	are congruent.
------------------------------	---------	-------	----------------

(b)	Write down all other pairs of congruent triangles.	(4 marks)
		LANDANAMAN WARAN KARANTAN KAR

9. At 1:00 a.m., a ship S is 100 km due east of a lighthouse L. S is moving at a speed of 20 km/h in the direction N 30° W as shown in Figure 2.

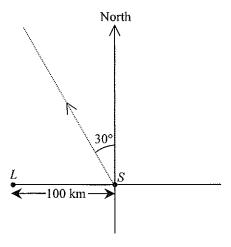


Figure 2

(a) Find the shortest distance between the ship and the lighthouse, correct to the nearest km.

(b)	At what time will the ship be nearest to the lighthouse?	(5 marks)
Manufacture and the second		
- a homeomorphism of the state		BARRAMARIA MARIA
***************************************		A.A. A.
TITE OF THE PROPERTY OF THE PR		
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Section A(2) (33 marks)
Answer ALL questions in this section and write your answers in the spaces provided.

	her part varies as the square of $L$ . When $L = 10$ , $V = 30$ and when $L = 15$ , $V = 75$	
(a)	Express $V$ in terms of $L$ .	(3 marl
		MANAGEMENT OF THE SECOND OF TH
(b)	Find the range of values of L when $V \ge 30$ .	(4 mai
` ,		
		AND THE PROPERTY OF THE PROPER
		MANAGEMENT OF THE PROPERTY OF THE PARTY OF T
		MATERIAL BURNASSON PROPERTY AND ASSESSED BY AND ASSESSED BURNASSON AND ASSESSED BY ASS

11.	(a)	For the set of data 10, 10, 11, 12, 13, 16, find	1
		(i) the mode, (ii) the median, (iii) the mean,	, , , , , , , , , , , , , , , , , , ,
		(iv) the range. (4 mar	:ks)
			and All colors had
	(b)	<ul><li>Four unknown data are combined with the six data in (a) to form a set of ten data.</li><li>(i) Find the least and the greatest possible values of the median of the combined set of data.</li></ul>	ten
		(ii) If the mean of the four unknown data is 11, find the mean of the combined set of ten da (4 mar)	ıta. rks)
			ALINE WALL

12. In Figure 3, AP is an altitude of the triangle ABC. It cuts the y-axis at H.

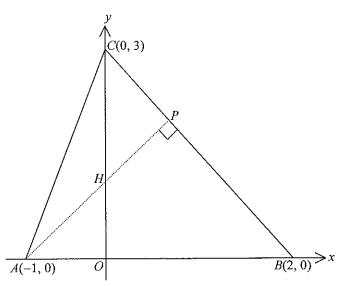


Figure 3

Find the slope of $BC$ .	(1 mark)
AND THE PROPERTY OF THE PROPER	
	A
Find the equation of $AP$ .	(3 marks)

(c)

(i)	Find the coordinates of $H$ .	
(ii)	Prove that the three altitudes of the triangle ABC pass through the same point.	(5 marks)
-v-10001010111		
		MI (II MINI MI MINI MI MANI MANI MANI MANI
		AMANTAINA MINTANA ANTANA A
		d.,,
en managaran		351164-1116-1111-5-W
A41 1400 NAV 1001 NAV 1000		
		***************************************
n:nv3:n:n:n		
-,-,		5-W-181-2-11-11-11-11-W-W-W-W-W-W-W-
		MATERIAL AND A STATE OF THE STA
		HALFALTERATE I DE OBEN-TANDE DE LA TRECORDE PAR
		OCCUPANTAL INTERNATION IN SECTION
ALIAN AND AND AND AND AND AND AND AND AND A		
AT HE PHILADERS		
· · · · · · · · · · · · · · · · · · ·		
		Salah Madamata Mada Mada Mada Mada Mada Mada Mada M
		, p. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

6

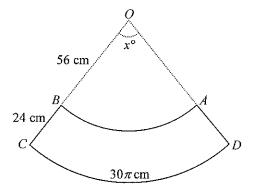


Figure 4(a)

It is known that  $\angle COD = x^{\circ}$ , AD = BC = 24 cm, OA = OB = 56 cm and  $\widehat{CD} = 30\pi \text{ cm}$ .

(a) (i) Find x.

(ii)	Find, in terms of $\pi$ , the area of $ABCD$ .	(4 marks)
,		
330207070-0-03		

(5 marks)

(b)

(

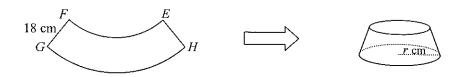


Figure 4(b)

Figure 4(c)

Figure 4(b) shows another thin metal sheet  $\it EFGH$  which is similar to  $\it ABCD$ . It is known that  $\it FG=18~cm$ .

- (i) Find, in terms of  $\pi$ , the area of *EFGH*.
- (ii) By joining EH and FG together, EFGH is then folded to form a hollow frustum of base radius r cm as shown in Figure 4(c). Find r.

(9 marks)

SECTION B (33 marks)

Answer any THREE questions in this section and write your answers in the spaces provided. Each question carries 11 marks.

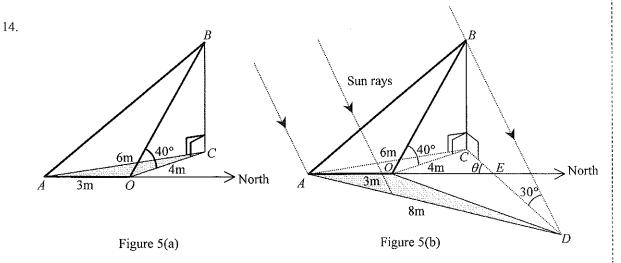


Figure 5(a) shows a triangular metal plate OAB standing on the horizontal ground. The side OA lies along the north-south direction on the ground. OB is inclined at an angle of  $40^{\circ}$  to the horizontal. The overhead sun casts a shadow of the plate, OAC, on the ground. OA = 3 m, OC = 4 m and AC = 6 m.

- (a) Find  $\angle OAC$ . (2 marks)
- (b) In Figure 5(b), OAD is the shadow of the plate cast on the horizontal ground when the sun shines from  $S \theta W$  with an angle of elevation  $30^{\circ}$ . AO is produced to cut CD at  $E \cdot AD = 8 \text{ m}$ .
  - (i) Find CD.
  - (ii) Find  $\angle CAD$ .
  - (iii) Using CE + ED = CD, or otherwise, find  $\theta$ .

Page tota
1
UNIVERSITY AND HARAS
1 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
WIR VIOLENT VI
AND THE PROPERTY OF THE PROPER

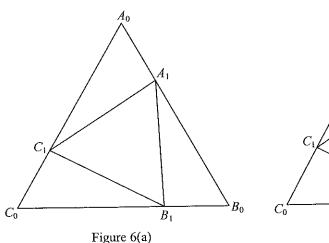
– 14 –

2003-CE-MATH 1-15

Go

Go on to the next page

15.



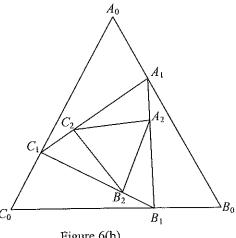


Figure 6(b)

Figure 6(a) shows an equilateral triangle  $A_0B_0C_0$  of side 1 m. Another triangle  $A_1B_1C_1$  is inscribed in triangle  $A_0 B_0 C_0$  such that  $\frac{A_0 A_1}{A_0 B_0} = \frac{B_0 B_1}{B_0 C_0} = \frac{C_0 C_1}{C_0 A_0} = k$ , where 0 < k < 1. Let  $A_1 B_1 = x$  m.

- Express the area of triangle  $A_1B_0B_1$  in terms of k. (a) (i)
  - Express x in terms of k. (ii)
  - Explain why  $A_1B_1C_1$  is an equilateral triangle. (iii)

(5 marks)

- Another equilateral triangle  $A_2B_2C_2$  is inscribed in triangle  $A_1B_1C_1$  such that (b)  $\frac{A_1 A_2}{A_1 B_1} = \frac{B_1 B_2}{B_1 C_1} = \frac{C_1 C_2}{C_1 A_1} = k$  as shown in Figure 6(b).
  - Prove that the triangles  $A_1B_0B_1$  and  $A_2B_1B_2$  are similar. (i)
  - The above process of inscribing triangles is repeated indefinitely to generate equilateral (ii) triangles  $A_3B_3C_3$ ,  $A_4B_4C_4$ ,  $A_5B_5C_5$ , ... Find the total area of the triangles  $A_1B_0B_1$  ,  $A_2B_1B_2$  ,  $A_3B_2B_3$  , ...

(6 marks)

Page to
u
AND AND THE PROPERTY OF THE PARTY OF THE PAR
waanana.a.a.a.a.a.a.a.a.a.
·
.,,,
vo. v
THE RELEASE OF THE PERSON AS T
·nvinum-re-ine

<del>- 16</del> -

.

16. John will participate in a contest to be held at a university. If John wins the contest, he will go to Canteen X for lunch. Otherwise, he will go to Canteen Y. The following table shows the types of set lunches and the prices served in the two canteens. He will choose one type of set lunch randomly.

Canteen	Set lunch	Price (\$)
	A	40
X	В	50
	C	15
Y	D	20

- (a) If the probability of John winning the contest is  $\frac{1}{10}$ , find the probability that he will spend \$15 for lunch. (2 marks)
- (b) If John takes a bus leaving at 8:00 a.m. to the university, his probability of winning the contest will be  $\frac{1}{10}$ . If he misses the bus, he will take a train leaving at 8:20 a.m. Owing to his nervousness, his probability of winning will be reduced to  $\frac{2}{25}$ .
  - (i) Suppose John misses the bus, find the probability that he will spend \$15 for lunch.
  - (ii) The following table shows the cost of a single trip by bus or train:

Transportation	Cost of a single trip (\$)
Bus	4.5
Train	7.5

It is known that the probability of John taking the bus is twice that of taking the train.

- (1) Find the probability that John will spend \$15 for lunch after the contest.
- (2) If John goes home by train after lunch, find the probability that he will spend more than a total of \$30 for the lunch and the transportation of the two trips.

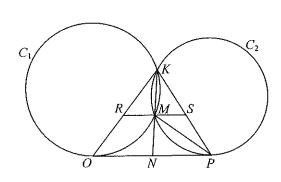
  (9 marks)

POPULATION AND ADDRESS OF THE POPULATION OF THE
Markhan at and an early an enemy
ROMENTA APPROPRIATE LEFT ENGINEEN VALUE OF LEFT AND AREA SEPTEMBRE
1000 H 100 H
Saidadda Chilinea a Chilinea dha Annaichta a Than
COLUMN TO THE STATE OF THE STAT
J
Madden of a Manden of a standard an account of an account
AND THE PROPERTY OF THE PARTY O
gr
C.C.C.COMMISSION MINISTER
- 16 m - 18 m -
dendered encodered the REF SECTION AND THE SEC

Page total

.6

17.



 $C_1$ 

Figure 7(a)

Figure 7(b)

- In Figure 7(a), OP is a common tangent to the circles  $C_1$  and  $C_2$  at the points O and P respectively. (a) The common chord KM when produced intersects OP at N. R and S are points on KO and KP respectively such that the straight line RMS is parallel to OP.
  - By considering triangles NPM and NKP, prove that  $NP^2 = NK \cdot NM$ . (i)
  - Prove that RM = MS. (ii)

(5 marks)

- A rectangular coordinate system, with O as the origin, is introduced to Figure 7(a) so that the (b) coordinates of P and M are (p, 0) and (a, b) respectively (see Figure 7(b)). The straight line RS meets  $C_1$  and  $C_2$  again at F and G respectively while the straight lines FO and GP meet at Q.
  - (i) Express FG in terms of p.
  - Express the coordinates of F and Q in terms of a and b. (ii)
- Prove that triangle QRS is isosceles. (iii) (6 marks)

Maket Market			
		THE PROPERTY OF THE PROPERTY O	
MUNICIPAL DE LA CALLETTE DE LA CALLE		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
HET TERETISSERIA TERETISTA (I MANAMA do Adria) de moderno de empero en en entre en entre en entre de entre en e	лительный принципальный принципальный принципальный принципальный принципальный принципальный принципальный пр	имменительного поставлення с тереворований поставлений поставлений поставлений поставлений поставлений поставл Поставления	V/NUJ
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
PPTPTERTURE PURIFICATION AND AND AND AND AND AND AND AND AND AN	HTHERINGERINGERINGERINGERINGERINGERINGERING		
			**************************************
atan menika menan sajaman menjan perpenankapan sikuktuk dikuktuk dikuktuk dikutuk sebah sejada mejaman apapap	TEPP PERSON TO SECTION SELECTION AND ACCOUNT ACCOUNT AND ACCOUNT A	and the spiritual state of the spiritual stat	a will will a financia a man and a his financia financia militari di historia
	•		
	######################################	ANIAMAN ANIAMA	NV 38 18 18 00 00 18 18 18 18 18 18 18 18 18 18 18 18 18
od obden en en en de de de en elle elle elle		on a see	
am berijaran aran inganara. Malababababababababababababababababababa	аныманым планиянныя провенняю пробес в « « « « « « « « « « « « « « « « « «	AINBIBIBITIATA (7) A = 14 p. 2 = 2 = 200 JERRINOVIEWS-VARIOUS (VARIOUS AINBIBITIES )	
ATTIONS OF THE TOTAL CONTROL OF THE STATE OF	OLANDANIA (A. 1919) (1919) — ————————————————————————————————	nga -g. — to mandala kalakakakakakakakakakakakakakakakaka	
nada madada (1814 n 1418) n kalama Winada da ayaya mamana ya mama kasala ala ala ala ala kala Willia (1818) (18	пананым анализманын анган такатын анган такатын анган такатын анган такатын анган такатын анган такатын анган т	HUNGBURGANIYA 19	
	**************************************	4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-	A
альными в него в меня не не невальнымым в него прыменя протиментеритуру.		WALANAMERINA MATERIAL PROPERTY OF THE STATE	ALLANDER BERT VIRGINIA PARA PARA PARA PARA PARA PARA PARA PA
AN NEW MICHIGAN AND MICHIGAN MICHIAN MI	пиналинения попиналинения попиную попин		ar a managar ay ay ar a mahar at i Arbitek ka Mahaka Mahaka Mahaka Mahaka Mahaka Mahaka Mahaka Mahaka Mahaka Ma
HILIBBUH DAVINGANINGANINGAN DIRANGANGAN DAVINGAN PP-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-	······································	HILDIANIANA —	
	WITH THE PROPERTY OF THE PROPE	······································	

0

·	Page tota
·	:
	1
	i
	are grane and the last to 1991
	BANDARY 1775

END OF PAPER