HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY
HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION

MATHEMATICS Compulsory Part PAPER 1 (Sample Paper) Question-Answer Book

Time allowed: 2 hours 15 minutes
This paper must be answered in English.

INSTRUCTIONS

- 1. Write your Candidate Number in the space provided on Page 1.
- 2. Stick barcode labels in the spaces provided on Pages 1, 3, 5, 7 and 9.
- 3. This paper consists of THREE sections, A(1), A(2) and B. Each section carries 35 marks.
- 4. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
- 5. Graph paper and supplementary answer sheets will be supplied on request. Write your Candidate Number, mark the question number box and stick a barcode label on each sheet, and fasten them with string INSIDE this book.
- 6. Unless otherwise specified, all working must be clearly shown.
- 7. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
- 8. The diagrams in this paper are not necessarily drawn to scale.

Please stick the barcode label here.

Candidate Number				

	Marker's Use Only	Examiner's Use Only
	Marker No.	Examiner No.
Question No.	Marks	Marks
1-2		
3-4		
5-6		
7-8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
Total		

Please stick the barcode label here.

3.	Facto	prize
	(a)	$3m^2 - mn - 2n^2 ,$
	(b)	$3m^2 - mn - 2n^2 - m + n$. (3 marks)
0		
4.		marked price of a handbag is $$560$. It is given that the marked price of the handbag is 40% or than the cost.
	(a)	Find the cost of the handbag.
	(b)	If the handbag is sold at $$460$, find the percentage profit. (4 marks)
1		

not lo	ose any games, find the number	games and gains a total of 84 points. Given that the champion do r of games that the champion wins. (4 mark

Figui	e 1 shows a solid consisting o	of a hemisphere of radius r cm joined to the bottom of a right circu
cone		
the vo	of height 12 cm and base rate olume of the hemisphere.	adius $r \mathrm{cm}$. It is given that the volume of the circular cone is two
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base radiume of the hemisphere. Find r. Express the volume of the second control of the	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base randle of the hemisphere. Find r .	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .
the vo	of height 12 cm and base radiume of the hemisphere. Find r. Express the volume of the second control of the	adius $r \ \mathrm{cm}$. It is given that the volume of the circular cone is two olid in terms of π .

7. In Figure 2, O is the centre of the semicircle ABCD. If AB # OC and $\angle BAD = 38^{\circ}$, find $\angle BDC$. (4 marks)

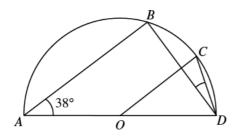
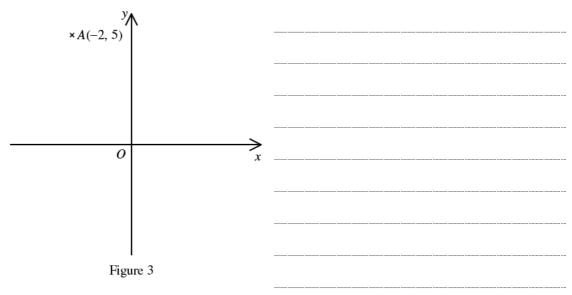


Figure 2

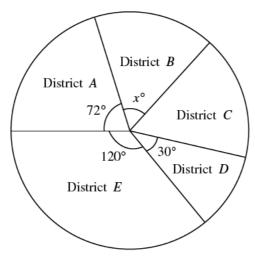
- 8. In Figure 3, the coordinates of the point A are (-2,5). A is rotated clockwise about the origin O through 90° to A'. A'' is the reflection image of A with respect to the y-axis.
 - (a) Write down the coordinates of A' and A''.
 - (b) Is OA'' perpendicular to AA'? Explain your answer.

(5 marks)

Answers written in the margins will not be marked.



9. In Figure 4, the pie chart shows the distribution of the numbers of traffic accidents occurred in a city in a year. In that year, the number of traffic accidents occurred in District A is 20% greater than that in District B.



The distribution of the numbers of traffic accidents occurred in the city

Figure 4

- (a) Find x.
- (b) Is the number of traffic accidents occurred in District A greater than that in District C? Explain your answer.

Answers written in the margins will not be marked.

(5 marks)

Please stick the barcode label here.

Section	on A(2)	(33 marks)
10.	(a) (b)	Find the quotient when $5x^3 + 12x^2 - 9x - 7$ is divided by $x^2 + 2x - 3$. (2 marks) Let $g(x) = (5x^3 + 12x^2 - 9x - 7) - (ax + b)$, where a and b are constants. It is given that $g(x)$ is divisible by $x^2 + 2x - 3$.
		(i) Write down the values of a and b .
		(ii) Solve the equation $g(x) = 0$. (4 marks)

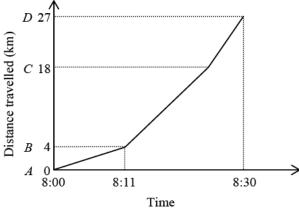


Figure 5

- (a) For which part of the journey is the average speed the lowest? Explain your answer. (2 marks)
- (b) If the average speed for Part II of the journey is 56 km/h, when is John at C? (2 marks)
- (c) Find the average speed for John driving from A to D in m/s. (3 marks)

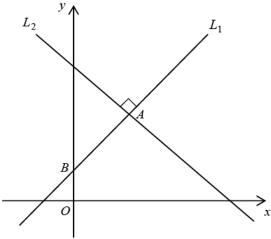


Figure 6

(a) Find the equation of L_2 .

(3 marks)

- (b) Q is a moving point in the coordinate plane such that AQ = BQ. Denote the locus of Q by Γ .
 - (i) Describe the geometric relationship between Γ and L_2 . Explain your answer.
 - (ii) Find the equation of Γ .

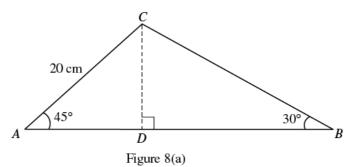
(6 marks)

Answers written in the margins will not be marked.

right, as shown in Figure 7. The first row has 12 seats. Each succeeding row has 3 more seats than the previous one. If the theatre cannot accommodate more than 930 seats, what is the greatest number of rows of seats in the theatre?
:
3rd row 28 14 26 44 45
2nd row 13 2 11 27 27
1st row Figure 7
(4 marks)

$B \qquad N = \log_8 E$ It is given that M and N are the magnitudes of an explosion on Scale A and Scale B rewhile E is the relative energy released by the explosion. If the magnitude of an explosion	
It is given that M and N are the magnitudes of an explosion on Scale A and Scale B rewhile E is the relative energy released by the explosion. If the magnitude of an explosion	
while E is the relative energy released by the explosion. If the magnitude of an explosion	
	is 6.4 (5 ma

18. In Figure 8(a), ABC is a triangular paper card. D is a point lying on AB such that CD is perpendicular to AB. It is given that AC = 20 cm, $\angle CAD = 45^{\circ}$ and $\angle CBD = 30^{\circ}$.

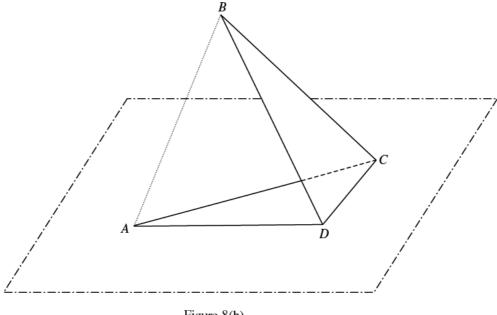


(a) Find, in surd form, BC and BD. (3 marks)

(5 marks)

Answers written in the margins will not be marked.

(b) The triangular paper card in Figure 8(a) is folded along CD such that ΔACD lies on the horizontal plane as shown in Figure 8(b).



- Figure 8(b)
- (i) If the distance between A and B is $18 \, \mathrm{cm}$, find the angle between the plane BCD and the horizontal plane.
- (ii) Describe how the volume of the tetrahedron ABCD varies when $\angle ADB$ increases from 40° to 140°. Explain your answer.

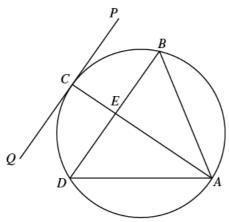


Figure 9

- (a) (i) Prove that $\triangle ABE \cong \triangle ADE$.
 - (ii) Are the in-centre, the orthocentre, the centroid and the circumcentre of $\triangle ABD$ collinear? Explain your answer.

(6 marks)

Answers written in the margins will not be marked.

(b) A rectangular coordinate system is introduced in Figure 9 so that the coordinates of A, B and D are (14, 4), (8, 12) and (4, 4) respectively. Find the equation of the tangent PQ. (7 marks)

		 		 100001000010000000000000000000000000000
***************************************				10.000.000.000.000.000.000.000
	 	 118080011811811811818181818181818181818	118001180081011800810101010101010101010	10010001111001111100111100
	 	 		100001000000000000000000000000000000000
	 	 		 100000000000000000000000000000000000000
	 	 		100001000000000000000000000000000000000
				TERRITORIUS DE LE CONTROL DE LA CONTROL DE L
		 		 100001000100000000000000000000000000000