BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

2000
MATHEMATICS IN PRACTICE

2 UNIT

Time allowed—Two hours and a half
(Plus 5 minutes reading time)

DIRECTIONS TO CANDIDATES

- Only Board-approved calculators are to be used.
- The mark out of 80 will be converted to a mark out of 100.

Section I (30 marks)
- This Section contains 30 multiple-choice questions.
- Attempt ALL questions.
- All questions are of equal value.
- Complete your answers in either blue or black pen on the Answer Sheet provided.
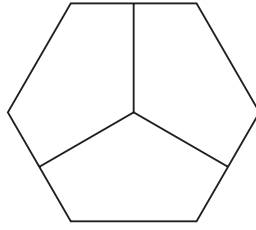- Allow about one hour for Section I.

Section II (50 marks)
- Attempt ALL questions.
- All questions are of equal value.
- Answer the questions in the spaces provided in this paper.
- Write your Student Number and Centre Number in the spaces provided on the first page of each question.
- Show all necessary working.
- Marks may be deducted for careless or badly arranged work.
- Allow about one hour and a half for Section II.

SECTION I

Attempt ALL questions.

All questions are of equal value.

Instructions for answering multiple-choice questions

- Complete your answers in either blue or black pen.

- Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample: 2 + 4 =   (A) 2   (B) 6   (C) 8   (D) 9

A ◯   B ●   C ◯   D ◯

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A ●   B ✖   C ◯   D ◯

If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word **correct** and drawing an arrow as follows.

correct

A ✖   B ✖   C ◯   D ◯

1 Sue's VCR uses twenty-four hour time. She wants to record a two-and-a-half hour movie which starts at 10 pm. Which of these settings is correct?

(A) ON at 10:00, OFF at 12:30

(B) ON at 22:00, OFF at 24:30

(C) ON at 22:00, OFF at 00:30

(D) ON at 10:00, OFF at 00:30

---

2 The floor plans of two bathrooms are shown. George and Sarah wish to buy new fittings for these bathrooms. The cost of fittings is as shown.

Bathroom fittings	
Toilet	$365
Bath (rectangular)	$580
Bath (corner)	$925
Shower screen	$420
Vanity (sink) unit	$800

What is the total cost of fittings for these two bathrooms?

(A) $3090   (B) $4255   (C) $4310   (D) $4675

---

3 David picks a card at random from a deck containing 12 red cards, 10 yellow cards, 5 blue cards and 8 green cards.

What is the probability that he selects a blue card or a red card?

(A) $\dfrac{5}{35}$ (B) $\dfrac{12}{35}$ (C) $\dfrac{17}{35}$ (D) $\dfrac{18}{35}$

4

Which of the following correctly describes this design?

(A) A hexagon divided into three pentagons.

(B) A hexagon divided into three quadrilaterals.

(C) An octagon divided into three pentagons.

(D) An octagon divided into three quadrilaterals.

---

5 During a survey, 1200 people were asked to state the single thing that most concerned them about celebrating New Year's Eve at a public venue. The results of this survey are shown.

Personal safety	32%
Transport	46%
Profiteering	4%
Something else	8%
Nothing would concern me	10%

How many people were most concerned about personal safety or transport?

(A) 78   (B) 384   (C) 552   (D) 936

6

LAGUNA QUAYS RESORT

DAY VISITOR BEACH CLUB ADMISSION

Full Day	Adult	$25·00
	Child	$15·00
	Family	$60·00

Half Day (4 hours)	Adult	$15·00
	Child	$10·00
	Family	$35·00

| Tennis court hire | — $20·00 per hour (2 racquets and 3 balls) |
	$5·00 per hour (court hire only)
Mountain bike/BMX hire	— $5·00/h; $12·00/4 h; $20·00/8 h
Rollerblade hire	— $15·00 per hour

Travel brochure reproduced with permission of Laguna Quays Management

The Nguyen family, consisting of two adults and two children, visited Laguna Quays Resort for a full day. They hired two mountain bikes for 4 hours and 2 pairs of rollerblades for 2 hours.
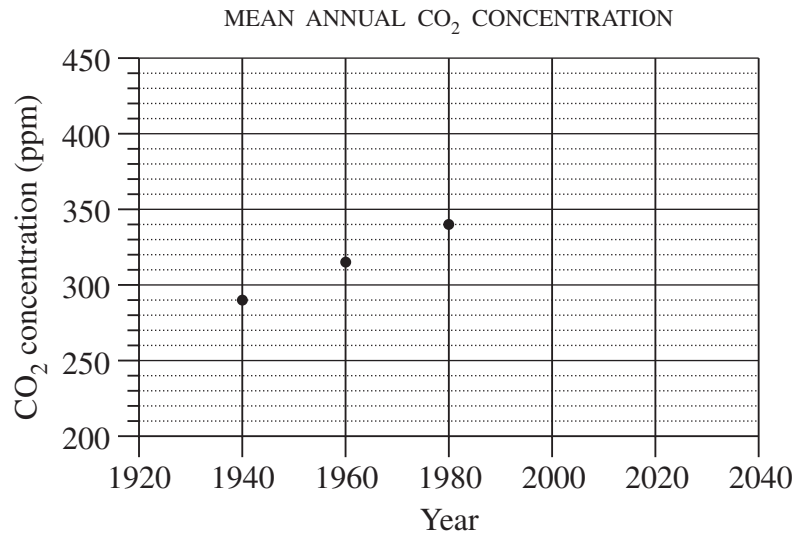
How much did the family's day at Laguna Quays cost?

(A) $102   (B) $114   (C) $140   (D) $144

7   Which of the following is the net of a triangular pyramid?

(A)

(B)

(C)

(D)

8

MEAN ANNUAL CO_2 CONCENTRATION
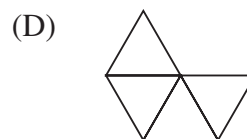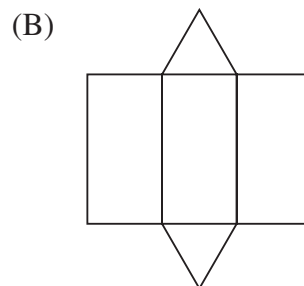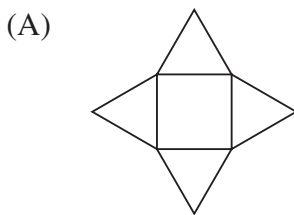
Graph from Gardner R & Shore E, Math in Science and Nautre, Franklin Watts, 1994, pp 134 & 136.

This graph shows the carbon dioxide (CO_2) concentration in the atmosphere, measured in parts per million (ppm).

If the trend continues, what would be the carbon dioxide concentration in 2020?

(A)   365 ppm   (B)   390 ppm   (C)   415 ppm   (D)   440 ppm

USE THE TABLE BELOW TO ANSWER QUESTIONS 9 AND 10.

TIMETABLE FOR FLIGHT HC200				
From	*To*	*Depart (Local time)*	*Arrive (Local time)*	*Flight time (hours : minutes)*
Sydney	Amsterdam	1720	0740	22:20
Amsterdam	London	0830	0900	1:30

9   What is the total flight time from Sydney to London on flight HC200?

(A)   15 h 40 min   (B)   23 h 30 min   (C)   23 h 50 min   (D)   26 h 20 min

10   Which of the following statements is correct?

(A)   Amsterdam local time is 1 hour ahead of London local time.

(B)   Amsterdam local time is 1 hour behind London local time.

(C)   Amsterdam local time is 30 minutes ahead of London local time.

(D)   Amsterdam local time is 30 minutes behind London local time.

11 This is a scale drawing of a block of land.

SCALE
1 : 1000

What is the area of this block of land?

(A) 1650 m^2 (B) 1800 m^2 (C) 16 500 m^2 (D) 18 000 m^2

**12** The following is part of a credit card statement.

Opening Balance	New Charges	Payments	Closing Balance
$506·03 +		− $118·94 =	

Date	Transaction Details	Amount ($)
18 Oct	Purchase — Grace Jones	85·90
22 Oct	FID — Government Duty	0·01
22 Oct	Payment Received	18·94 −
25 Oct	FID — Government Duty	0·06
25 Oct	Payment Received	100·00 −
11 Nov	Interest Charged	4·64

The New Charges and Closing Balance have been omitted.
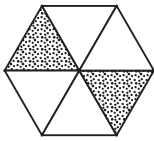
Which of the following is correct?

(A) New Charges $85·90 Closing Balance $301·19

(B) New Charges $85·90 Closing Balance $472·99

(C) New Charges $90·61 Closing Balance $296·48

(D) New Charges $90·61 Closing Balance $477·70

13
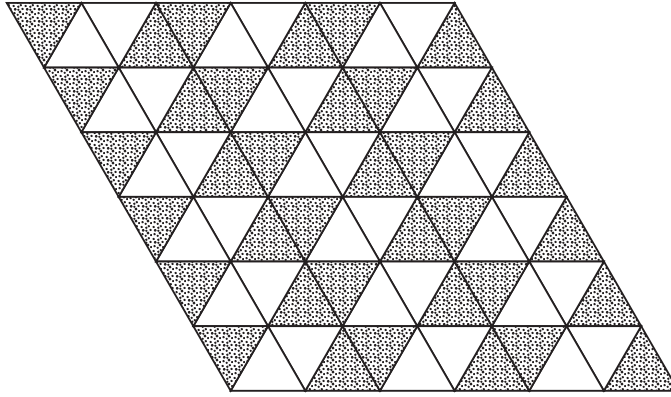
Which one of the following tiles is included in this design?
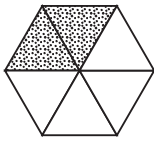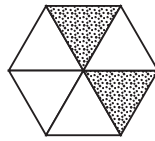
(A)   (B)   (C)   (D)
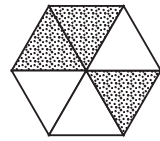
14

RHODE ISLAND CHICKEN

Available only in these packs:

3 piece pack	$3·75
5 piece pack	$6·00
8 piece pack	$8·80

Emily wants to buy exactly 18 pieces of chicken.

What is the lowest amount she can pay for 18 pieces of chicken?

(A) $19·80   (B) $20·80   (C) $21·75   (D) $22·50

15

> ### THREE ISLAND CRUISE
>
> *South Molle — Hamilton Island — Whitehaven*
>
> | | | |
> |---|---|---|
> | Depart Shute Harbour | 8:45 am | |
> | South Molle Island | 9:10 am | – 10:45 am |
> | Hamilton Island | 11:05 am | – 12:45 pm |
> | Whitehaven Beach | 1:10 pm | – 4:00 pm |
> | Return Shute Harbour | 5:20 pm | |

Timetable reproduced with permission of Fantasea Cruises

During a holiday in Queensland, John and Francesca take this Three Island Cruise.

How much time during the trip is spent travelling from one place to the next?

(A)   1 hour 45 minutes

(B)   2 hours 30 minutes

(C)   6 hours 5 minutes

(D)   8 hours 35 minutes

16

WORLD COFFEE PRODUCTION
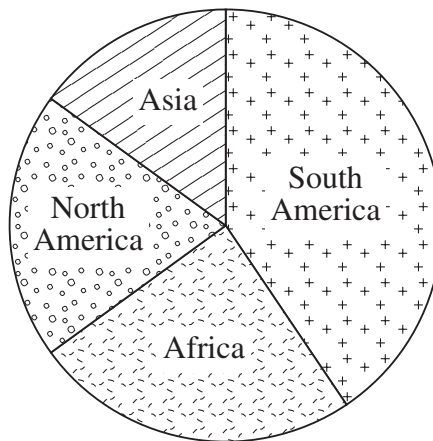
Diagram from Ralph & Stacey, Longman Cheshire Atlas for Secondary Schools, 2nd ed 1992, p 118. Reprinted with permission of Pearson Education Australia, www.longman.com.au

What percentage of the world's coffee is produced in North America?

(A)   20%   (B)   25%   (C)   30%   (D)   72%

17   The retail price of a washing machine is $990. A store discounts the retail price by 10% and charges a $20 delivery fee.

How much does it cost to buy the washing machine from the store and have it delivered?

(A) $871   (B) $911   (C) $1069   (D) $1109

USE THE FOLLOWING MAP TO ANSWER QUESTIONS 18 AND 19.

Map from Ralph & Stacey, Longman Cheshire Atlas for Secondary Schools, 2nd ed 1992, p 64.
Reprinted with permission of Pearson Education Australia, www.longman.com.au.

SCALE

100 km

18 What is the position of Norrköping on the map?

(A) 58·5°S 16°W   (B) 58·5°S 16°E   (C) 58·5°N 16°W   (D) 58·5°N 16°E

19 What is the approximate distance (in a straight line) from Stockholm to Norrköping?

(A) 50 km   (B) 130 km   (C) 200 km   (D) 300 km

20   A radio station charges its sponsors $1500 for each 30 seconds of advertising.

Between 8 am and 9 am one morning, the radio station collected $36 000 in advertising fees.

What percentage of that hour was allocated to advertising?

(A)   12%   (B)   20%   (C)   24%   (D)   40%

21

HOW YOUR PHONE BILL COMPARES

One.Talk

200 local calls	$35
10 peak calls to UK	$17·50
10 peak calls long distance.......	$22
Monthly rental charge.................	$11·65
	TOTAL DUE: $86·15

STARTEL

200 local calls	$46
10 peak calls to UK	$36
10 peak calls long distance.......	$18
Monthly rental charge.................	$11·65
	TOTAL DUE: $111·65

APTA

200 local calls	$30
10 peak calls to UK	$20
10 peak calls long distance.......	$22
Monthly rental charge	$15
	TOTAL DUE: $87

Octopus

200 local calls	$40
10 peak calls to UK	$24
10 peak calls long distance.......	$25
Monthly rental charge.................	$10·95
	TOTAL DUE: $99·95

If calls to the UK are not included in the above comparison, which company offers the best deal?

(A)   One.Talk   (B)   STARTEL

(C)   APTA   (D)   Octopus

22 The daily interest rate for the outstanding balance on a credit card was 0·037%. The interest charged for 29 days was $9·12.

How much was the outstanding balance (to the nearest dollar)?

(A) $71 (B) $246 (C) $850 (D) $24 649

23
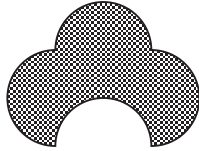
This logo is based on a square and semicircles.

Which of the following combinations of shapes has an area equal to the area of the logo?

(A)

(B)

(C)

(D)

24

1·4 m

NOT TO SCALE

5 m

9 m

Laurie and Heather's pool is in the shape of a rectangular prism. Find the cost of re-tiling the interior of the pool if the tiler charges $34 per square metre.

(A) $1132·80 (B) $2142 (C) $2862·80 (D) $4392·80

25 Ingrid's flight from Sydney to Stockholm will take thirty-six hours. Her plane leaves Sydney at 5 pm on Sunday night. Local time in Stockholm is ten hours behind local time in Sydney.

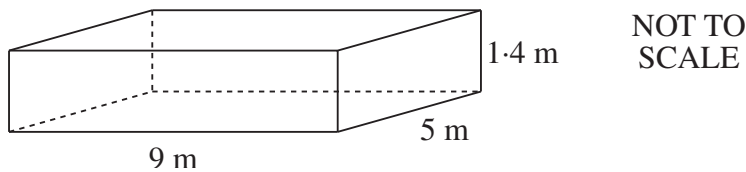What will the time be in Stockholm when Ingrid lands there?

(A)　7 pm Monday

(B)　2 am Tuesday

(C)　5 am Tuesday

(D)　3 pm Tuesday

26
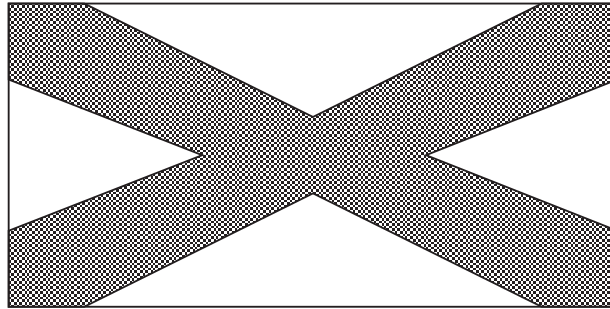
Approximately what percentage of the area of the flag is shaded?

(A)　40%　　　　(B)　46%　　　　(C)　50%　　　　(D)　56%

---

27 Zoran returned to Sydney from an overseas holiday with 50 French francs and 20 UK pounds, and converted this money to Australian dollars. Exchange rates are given in the table.

$A1 IS EQUIVALENT TO			
Canadian dollar	0·88	Japanese yen	61·6
Euro	0·59	NZ dollar	1·19
French franc	3·88	Singapore dollar	0·99
German mark	1·16	Swiss franc	0·95
HK dollar	4·62	Thai baht	21·4
Indonesian rupiah	3974	US dollar	0·61
Italian lira	1144	UK pound	0·38

Table of exchange rates reproduced with permission of John Fairfax Holdings Limited

How many Australian dollars did Zoran receive?

(A)　$20·49　　　(B)　$65·52　　　(C)　$201·60　　　(D)　$246·63

28 In 1999, 80 000 litres of oil were spilled on Sydney Harbour. In order to illustrate the amount of oil spilled, a Sydney newspaper published the following graphic.

How much is 80 000 litres?

The amount of oil spilled was equivalent to 560 barrels, or the volume of one-and-a-half backyard pools.

× 560

1 barrel = 143 litres (approximately)

15 metres

8 metres
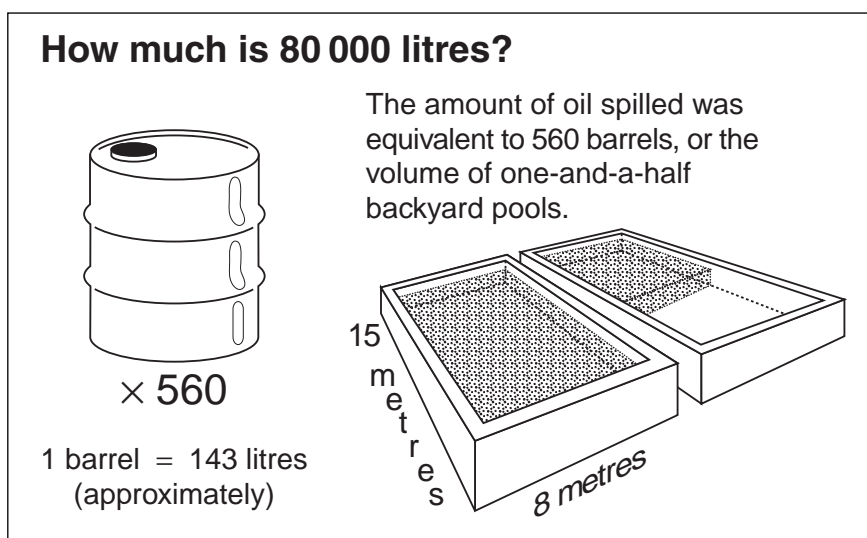
Diagram reproduced with permission of John Fairfax Holdings Limited

Assume that both the backyard pools illustrated have the same constant depth.

What is the depth of the pool? ($1 \text{ m}^3 = 1000 \text{ L}$)

(A) 0·44 m   (B) 0·67 m   (C) 1 m   (D) 1·5 m

---

29 At the end of 1999, Cynthia bought a house for $350 000.

During the year 2000, Cynthia's house increased in value by 4%. It is predicted that the value of the house will fall by 1% during 2001.

If this prediction is correct, what will be the value of Cynthia's house at the end of 2001?

(A) $339 500   (B) $360 360   (C) $360 500   (D) $367 640

30

SHIFTY'S DISCOUNT SALE

Shoes   20% off normal prices
Clothes 15% off normal prices

Rita buys a pair of shoes and a coat at Shifty's for a total of $116.

The shoes are normally $60.

What is the normal price of the coat?

(A) $56   (B) $48   (C) $68   (D) $80

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STUDENT NUMBER

2000
HIGHER SCHOOL CERTIFICATE EXAMINATION
MATHEMATICS IN PRACTICE
2 UNIT

CENTRE NUMBER

SECTION II

Attempt ALL questions.

All questions are of equal value.

Answer the questions in the spaces provided.

Show all necessary working.

Write your Student Number and Centre Number in the spaces provided
on the first page of each question.

QUESTION 31 The Consumer

(a) The following is part of a telephone bill, showing the times and the amounts charged for three STD calls.

Date	Time	Place	min:sec	$
09 April	05:51 pm	Bargo	1:20	0·26
20 April	06:40 pm	Bargo	0:33	0·19
24 April	08:33 pm	Bargo	0:26	0·17

What rate (in cents/minute) was charged for the call made on 9 April?

....

....

Question 31 continues on page 18

QUESTION 31 (Continued)

(b) Ashwini and Cassandra go shopping at a store that displays the following advertisement.

<div style="border:1px solid black;text-align:center">

SALE
25% OFF
ALL MARKED PRICES

</div>

(i) Ashwini buys a pair of jeans marked at $84. How much does she pay for the jeans?

....

....

(ii) Cassandra pays $18 for a T-shirt. How much does she save?

....

....

(c) The following table lists the *fortnightly* repayments for personal loans over different periods of time.

AMOUNT BORROWED	FORTNIGHTLY REPAYMENTS IN DOLLARS		
	Over 3 years	*Over 4 years*	*Over 5 years*
$20 000	$315	$252	$214
$21 000	$331	$264	$225
$22 000	$347	$277	$236
$23 000	$362	$293	$247
$24 000	$378	$306	$258
$25 000	$394	$318	$269
$26 000	$410	$331	$280
$27 000	$425	$344	$291

(i) Nicole can afford to repay $270 per fortnight. What is the maximum amount Nicole can borrow?

....

QUESTION 31 (Continued)

    (ii)   Nicole decides to borrow $21 000 and repay the loan over 5 years. How much will Nicole repay in total?

....

....

    (iii) If Nicole had decided to repay the $21 000 loan over 4 years instead of 5, how much would she have saved?

....

....

(d)   John puts a $280 bracelet on lay-by. He pays 10% deposit, and the remainder in seven equal weekly payments.

How much is each weekly payment?

....

....

(e)   Dimitri bought a jet-ski valued at $8500 from a company that offered him a deferred payment plan. Dimitri paid for the jet-ski in 24 monthly instalments of $480 each.

    (i)   How much extra did Dimitri pay for the jet-ski?

....

....

    (ii) What was the annual rate of interest charged? (Give your answer correct to one decimal place.)

....

....

QUESTION 31 (Continued)

(f)   The table below is used by Basil's Insurance Company to calculate the monthly premium to be charged for life insurance.

RATE TABLE
(RATE IN $ PER $1000 OF COVER)

Age	Male	Female
25	0·83	0·62
26	0·84	0·63
27	0·85	0·65
28	0·86	0·66
29	0·88	0·68

(i)   Angela is a 26-year-old female. She decides to take out life insurance of $50 000. What will be her monthly premium?

....

....

(ii) Geoffrey is a 28-year-old male. His monthly premium is $68·80.

For how much is Geoffrey insured?

....

....

2000
HIGHER SCHOOL CERTIFICATE EXAMINATION
MATHEMATICS IN PRACTICE
2 UNIT—SECTION II

QUESTION 32 Travel

(a)
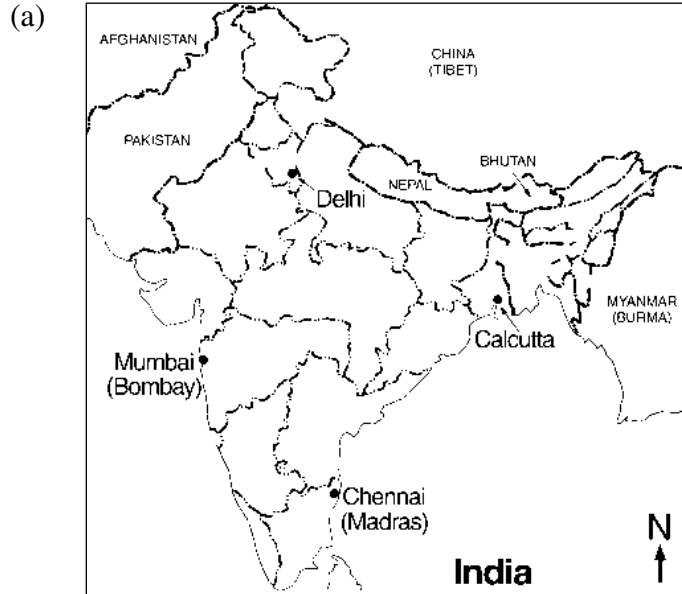
Map from India, 7th ed, Lonely Planet, 1997.
Reproduced by permission of Lonely Planet Publications.

In which direction is Delhi from Calcutta?

....

....

(b)   In 1999, Zoe and Sunita spent eight weeks travelling together in India.

Zoe purchased the minimum recommended travel insurance from Coverall Insurance. She chose the $250 excess option.

COVERALL TRAVEL INSURANCE PREMIUMS

Minimum recommended for travel to	Excess options	Days						Weeks					
		5	8	12	16	23	31	5	6	7	8	9	10
PLAN **A** The Americas, Europe, Japan, China, The Middle East or Africa	$NIL	79	93	107	126	153	189	223	247	272	295	316	342
	$100	76	88	100	116	143	178	201	225	247	269	289	315
	$250	69	80	91	101	127	157	172	193	213	235	255	280
PLAN **B** India, South East Asia or elsewhere in the world	$NIL	69	79	89	103	131	165	200	231	253	274	295	315
	$100	66	75	83	95	122	155	180	210	230	250	270	290
	$250	60	68	76	83	109	137	154	180	198	218	238	258

How much did she pay for travel insurance?

....

589

Question 32 continues on page 22

QUESTION 32 (Continued)

(c) On 12 November, Zoe and Sunita started 'The Desert Safari' tour, from Udaipur to Delhi via Pushkar. They shared a room to save costs.

TRIP FILE — THE DESERT SAFARI

Tour cost
Prices per person

Twin share	Single supplement
$1770	**$230**

Extras
Pre/post accommodation

	Twin	Single
Udaipur	**$22**	**$43**
Delhi	**$18**	**$30**

Camel Fair surcharge

Twin	Single
$129	**$205**

Departures
1999

Start	Finish
24 Sep.	08 Oct.
22 Oct.	05 Nov.
12 Nov.	26 Nov.*
24 Dec.	07 Jan. 2000

* Includes Pushkar Camel Fair, surcharge applies

NOTES:

Pre- and post-tour accommodation

Arrangement can be made for additional accommodation to be pre-booked at your joining and finishing hotels, at the prices shown.

Camel Fair surcharge

This covers increased costs in Pushkar at Camel Fair time.

Extract form Integrity Group Tours brochur, 1999-2000, p 13.
Reproduced by permission of Integrity Group Tours.

(i) Zoe and Sunita pre-booked two additional nights accommodation in Delhi. What was the total cost of 'The Desert Safari' tour for each of them?

....

....

(ii) What percentage of the total cost was the Camel Fair surcharge for Zoe and Sunita?

....

....

(iii) Marc is a single person who took the same tour. He had pre-booked three nights in Udaipur and one night in Delhi. What was the total cost for Marc?

....

....

QUESTION 32 (Continued)

(d)   In Delhi, Zoe and Sunita stayed at the Imperial Hotel, shown on the map below.

Map from India, 7th ed, Lonely Planet, 1997.
Reproduced by permission of Lonely Planet Publications.
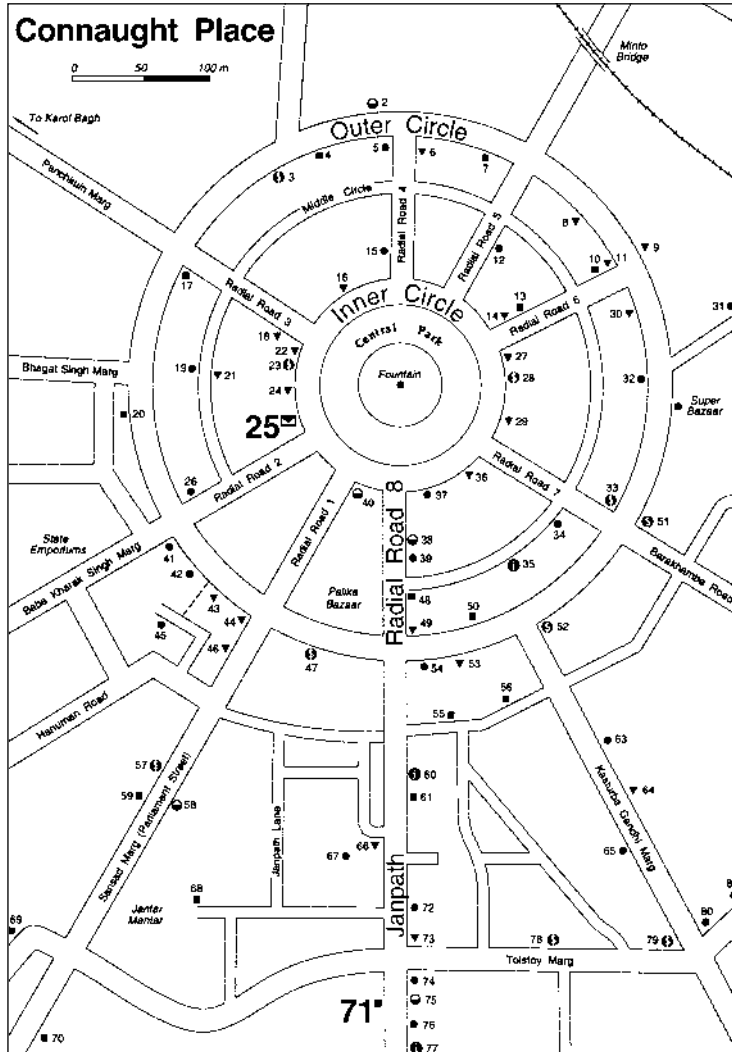
25:   Post Office

71:   Imperial Hotel

(i)   Zoe and Sunita chose the shortest possible route (using the roads) to walk from their hotel to the Post Office. Describe their route.

....

....

....

(ii)   What is the circumference of the outer edge of the Outer Circle in Connaught Place? Give your answer in kilometres, correct to one decimal place. (Circumference = $2\pi r$)

....

....

Question 32 continues on page 24

QUESTION 32 (Continued)

(e)   On 28 November, Zoe and Sunita travelled second class on the Tamil Nadu Express from Delhi to Chennai.

Major Trains from Delhi

Destination	Train name and number	Departure time	Distance (km)	Duration (hours.mins)	Fare (Rs)* (2nd/1st)
Agra	2180 *Taj Express*	7:15 am	199	4.35	49/223
	2002 *Shatabdi Express*	6:15 am		1.55	275/530
Calcutta	2302 *Rajdhani Express*	5:15 pm	1441	18.00	1015/2895
	2304 *Poorva Express*	4:30 pm		24.00	270/995
Chennai (Madras)	2622 *Tamil Nadu Express*	10:30 pm	2194	33.20	324/1359
Jaipur	2901 *Pink City Express*	5:45 am	308	6.00	72/318
	Shatabdi Express	5:15 am		4.25	350/685
Mumbai (Bombay)	2952 *Rajdhani Express*	4:00 pm	1384	17.00	825/2835
	1038 *Punjab Mail*	6:00 am		26.00	263/965
Udaipur	9617 *Garib Nawas Express*	5:45 am	739	17.45	181/632
Varanasi	2382 *Poorva Express*	4:30 pm	764	12.20	186/649

Train timetable from India, 7th ed, Lonely Planet, 1997.
Reproduced by permission of Lonely Planet Publications.

*   Rs = Indian rupees

(i)   At what time and on what date did they arrive in Chennai?

....

(ii)   The exchange rate was $A1 = Rs 27·20. What was Zoe's fare on the Tamil Nadu Express in Australian dollars?

....

(iii)   What was the average speed of the train?

....

(f)   Indian time is $5\frac{1}{2}$ hours ahead of Greenwich Mean Time (GMT). In December, the time in Perth is 8 hours ahead of GMT.

Zoe called her mother in Perth on 2 December at 3 pm Perth time. What was the time in India when she called?

....

....

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QUESTION 33 Accommodation

(a) A building company charges the following prices to build 'The Glenview' style house.

T h e   G l e n v i e w

		Normal price	Launch offer price
3 bedroom ensuite	Single garage	$80 660	$70 660
4 bedroom ensuite	Single garage	$84 220	$74 220
4 bedroom rear rumpus	Single garage	$88 430	$78 430 / $81 980
5 bedroom side rumpus	Single garage	$91 980	

Options
~~Double~~ garage — Additional — $2 150
Double bay windows to dining — Included — Nil

Frontal facades

Classic	No charge	Federation 'E'	$3 590
Colonial	$830	Victoriana	$4 690
Federation 'A'	$2 800	Vogue 2000	$4 070
Federation 'C'	$2 950	Vogue 2001	$2 800

(i) Calculate the cost of building a four-bedroom house with a rear rumpus, double garage and the cheapest Federation facade.

....

....

(ii) What is the percentage discount offered on the three-bedroom ensuite with single garage and classic facade?

....

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Question 33 continues on page 26

QUESTION 33 (Continued)

(b)   Below is the ground floor plan of a house.
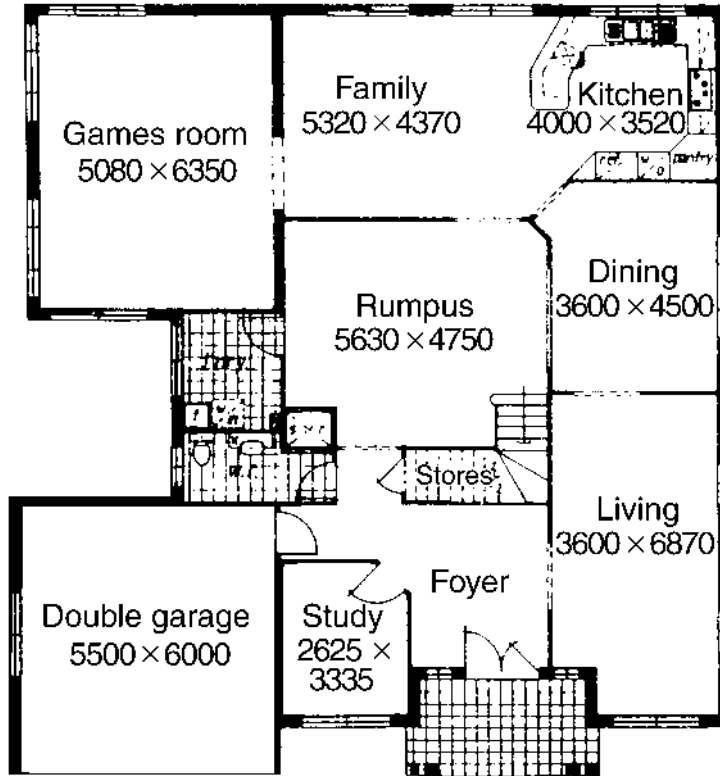
(i)   What is the perimeter of the games room?

....

(ii)   The window of the dining room faces south.

In which direction does the window in the study face?

....

(iii)   The garage floor is to be tiled.

Each tile is 50 cm by 50 cm.

1   How many tiles are needed to cover the garage floor?

....

2   The tiles are supplied in boxes of 30. Only full boxes can be purchased.

How many boxes need to be purchased to tile the garage floor?

....

QUESTION 33 (Continued)

(c)   This is a scale drawing of the floor plan of a house.
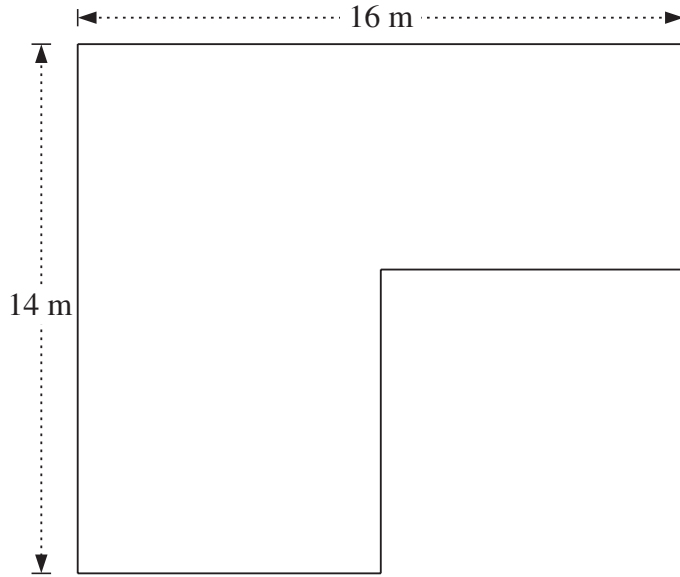
(i)   What is the scale used?

....

(ii)   What is the floor area of the house?

....

....

(iii) The house is to be built on a concrete slab which is 350 mm thick.

Find the volume of concrete in the slab. Give your answer in cubic metres.

....

....

QUESTION 33 (Continued)

(d) A real-estate agent charges the following fees for selling a property.

Sale Value of Property	Fee
Up to and including $50 000	5%
On the next $70 000	3%
On the remainder	2%

This agent sells a unit for $95 000. Calculate the agent's fee.

....

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....
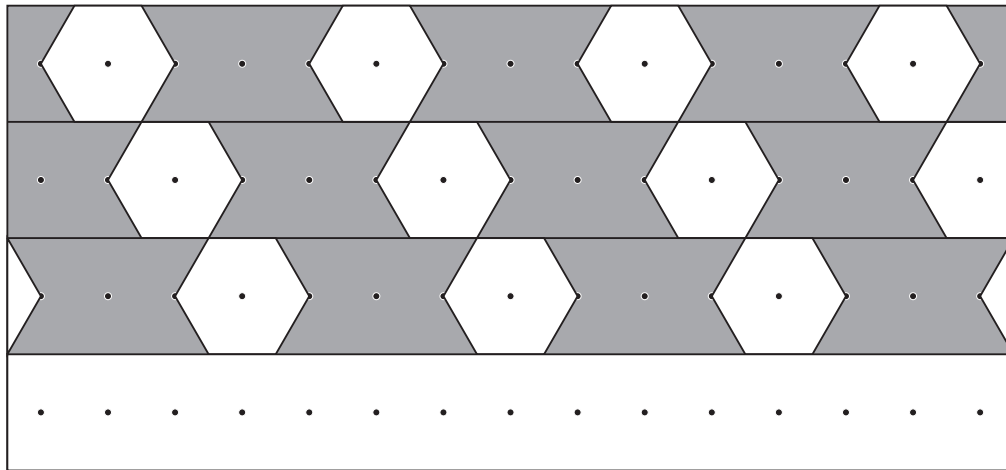
Q.34

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QUESTION 34 Design

(a)

Use your ruler to complete the last row of this tessellation.

(b)

20 cm   60 cm   20 cm

50 cm   50 cm

30 cm   20 cm   20 cm   30 cm
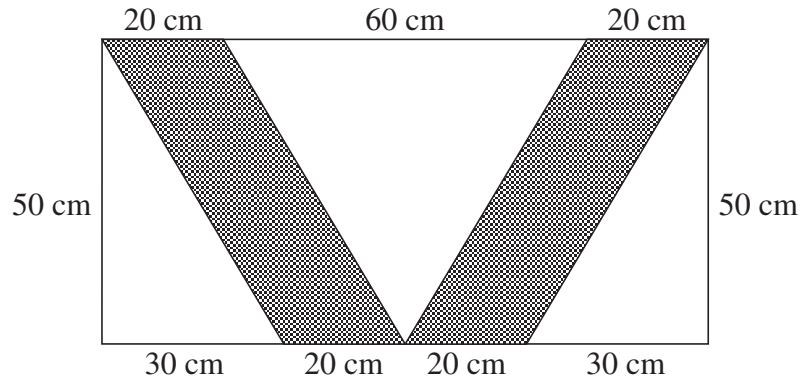
(i)   What is the area of this flag in square metres?

....

(ii)   What fraction of the flag is the shaded V?

....

....

....

591

QUESTION 34 (Continued)

(c)
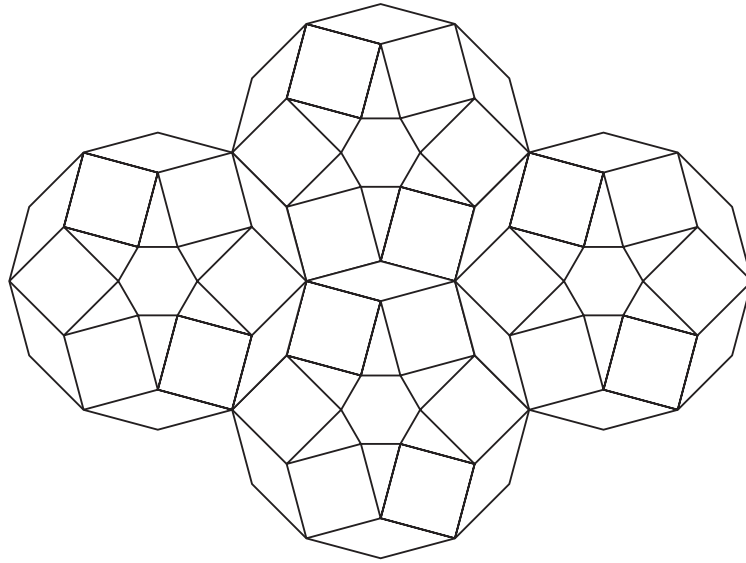
This pattern was constructed using tiles of four different geometric shapes. Squares and isosceles triangles are two of the shapes.

Name the other two shapes.

....

(d)   This design uses five identical semicircles.
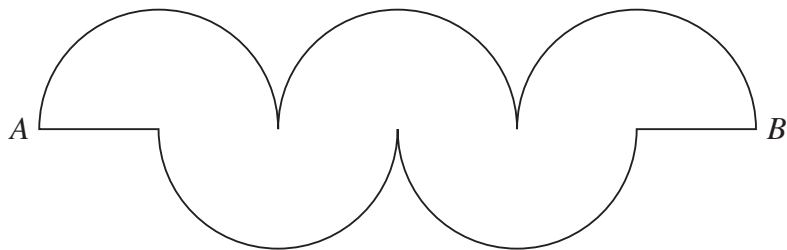
Use your compasses to enlarge this design in the space below, so that its length is 15 cm.

•
A

•
B

QUESTION 34 (Continued)

(e)   Classi chocolate balls, each with a diameter of 3 cm, are packed into a triangular prism. The base of the prism is an equilateral triangle.

(i)   Part of the pattern for the first layer of chocolate balls is shown.
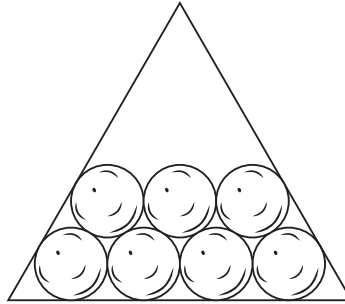
Complete the pattern for the first layer on the diagram above.

(ii)   The height of the prism is 24 cm.

24 cm

NOT TO SCALE
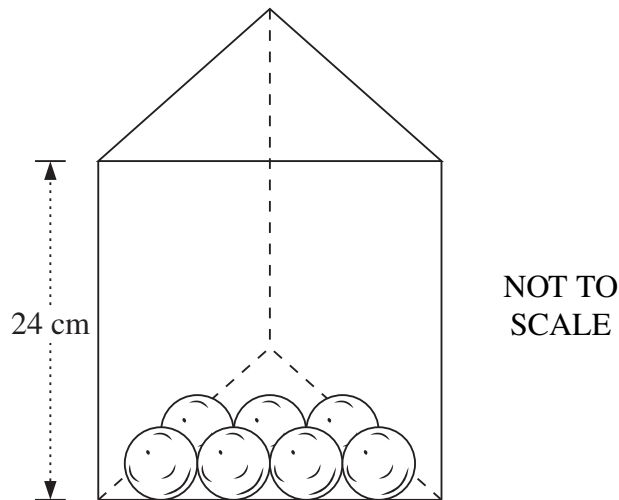
If the number of chocolates in each layer is the same, how many chocolate balls fill the prism?

....

....

QUESTION 34 (Continued)

(f)   The cardboard separator illustrated is placed inside the box to protect bottles. It fits exactly inside the box.
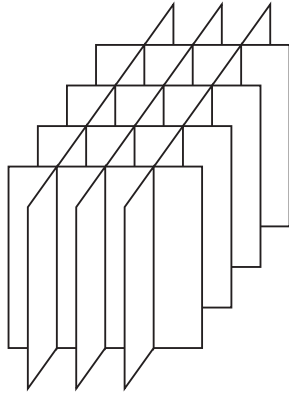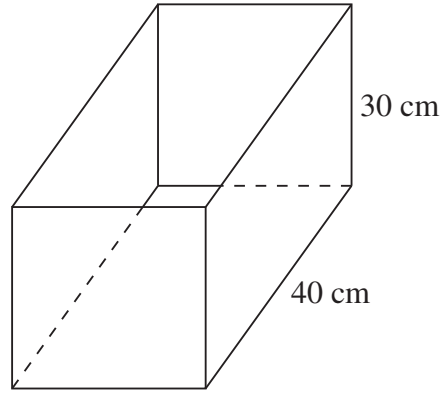
Cardboard separator   32 cm

(i)   If only one bottle fits in each separate section, how many bottles will fit into the box?

....

(ii)   Find the total area of cardboard needed to make the separator.

....

....

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QUESTION 35 Social Issues

(a)

REGIONAL POLLUTION INDEX			
Date	*East Sydney*	*North-west Sydney*	*South-west Sydney*
1 January	11	12	13
2 January	10	17	10
3 January	18	20	24
4 January	24	48	56
5 January	14	36	41
6 January		30	37
7 January	21	40	50
Average for the week	16	29	33

Pollution data reproduced with permission of Environment Protection Authority.

(i) Pollution levels are said to be HIGH when the index is 50 or higher, and MEDIUM when the index is greater than or equal to 25, and less than 50.

For the South-west Sydney region, what percentage of the daily readings are in the MEDIUM range?

....

....

(ii) Calculate the value of the pollution index for East Sydney on 6 January.

....

....

Question 35 continues on page 34

QUESTION 35 (Continued)

(b)   In a recent election the following primary votes were recorded.

Candidate	Number of votes
Smith	95 700
Jones	29 940
Yuen	123 860

(i)   A television reporter said: 'Jones received 12% of the votes. This means that one person in twelve voted for Jones.'

Was the reporter correct? Give reasons for your answer.

....

....

....

(ii)   The voting system was preferential.

Twenty per cent of Jones' votes went to Yuen and the rest went to Smith. Complete the following table to show the number of votes for Smith and Yuen after preferences were distributed.

Smith	
Yuen	

QUESTION 35 (Continued)

(c) (i) The table shows estimates of land use in Indonesia in 1993.

Land use	Percentage of land
Arable land	10%
Crops	8%
Pastures	8%
Forests	60%
Other	14%

Complete the divided bar chart below to show this information.

(ii) By the end of 1999 the estimate for the percentage of forests in Indonesia had decreased to 41%, due to deforestation. There are $1\,826\,440\,km^2$ of land in Indonesia.

What was the estimated area of forests in Indonesia at the end of 1999?
Give your answer in hectares. $(1\,km^2 = 100\,ha)$

....

....

(iii) The 'forest-to-people index' is the number of hectares of forests per person. In 1999, the population in Indonesia was 216 108 300. Use your answer to part (ii) to find the forest-to-people index at the end of 1999. (Give your answer correct to two decimal places.)

....

(iv) It is estimated that 1·5 million hectares of forests are destroyed in Indonesia each year, and that the population is growing at 1·46% per year. Assume that these estimates are correct in 2000 and 2001.

1 What will be the population in Indonesia at the end of 2001?

....

....

2 What will be the forest-to-people index at the end of 2001?

....

....

....

End of paper

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