

**Section 1**

**Total marks**

**Attempt Questions 1 – 20**

**Allow about 25 minutes for this section.**

Use the multiple choice answer sheet provided.

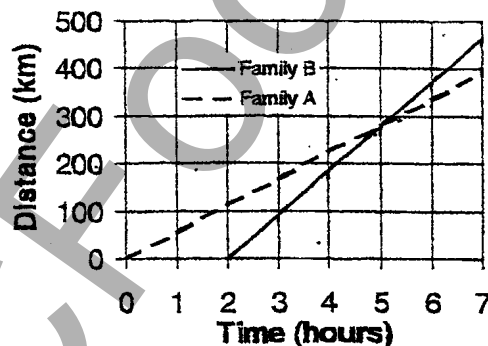
1. In a class of 25 students there are 15 boys and 10 girls. If a student is chosen at random from the class, the probability that the student is not a girl is :

- A. 10%                      B. 15%                      C. 40%                      D. 60%

2. Which of the following is not equivalent to  $8x^2$  ?

- A.  $\frac{16x^2}{2}$                       B.  $4x^2 + 5x^2 - x^2$                       C.  $(4x)^2$                       D. 4x times 2x

3. Two families are travelling on holidays. Family B leaves two hours later than Family A travelling at a faster speed.



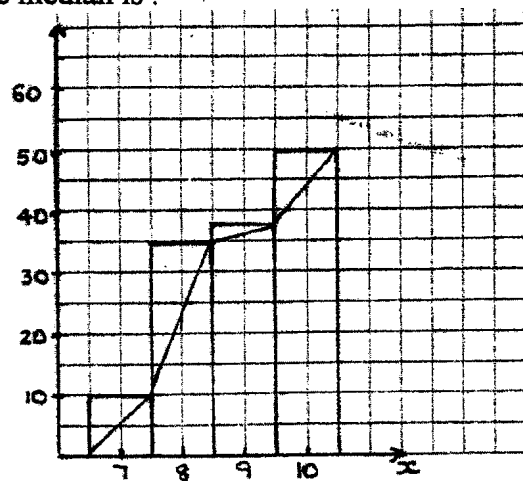
How soon after Family B's departure will they meet Family A ?

- A. 2 hours                      B. 3 hours                      C. 5 hours                      D. 7 hours

4. When a card is chosen at random from a standard deck of 52 cards, which of the following events is most likely to occur ?

- A. choosing a seven                      B. choosing a club  
 C. choosing a picture card                      D. choosing a black card

5. For the distribution shown in the cumulative frequency histogram and polygon, the median is :



- A. 7.5      B. 8      C. 8.5      D. 9

6.  $2x(3x - 4y) - y(8x - 6y) =$

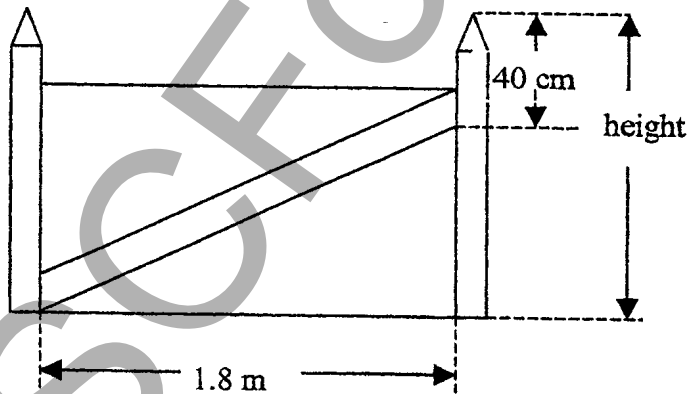
A.  $6x^2 + 6y^2$

B.  $6x^2 - 6y^2$

C.  $6x^2 - 16xy + 6y^2$

D.  $6x^2 + 16xy - 6y^2$

7. A fence is held by a 2.5 metre long diagonal brace as shown.



The height of the fence on the diagram would be nearest to :

- A. 3.1m      B. 1.7m      C. 2.5m      D. 2.1m



13. Which of the following is an example of discrete data ?

- A. The height of year 9 students
- B. The colour of hair of students in year 12
- C. The time taken to complete an assignment
- D. The number of cars stolen each year

14. Mr and Mrs Yousef research the typical price of a family car. At one car yard they find six family cars. Five are priced between \$30 000 and \$40 000, while the sixth car is priced at \$80 000. What is the best measure of the price of a typical family car ?

- A. Median
- B. Mean
- C. Mode
- D. All are equally valid

15. Jack and George want to invest money regularly so that in time they will have \$200 000 to buy a yacht. They plan to invest monthly amounts in an annuity which pays 6% p.a. for the full 20 years. The monthly amount they would need to invest to get closest to their goal would be :

- A. \$300
- B. \$400
- C. \$440
- D. \$480

16. A refrigerator with a cash price of \$1800 is bought on the following terms : 20% deposit with the balance to be paid in 12 equal monthly instalments at 12% p.a. flat interest rate. How much is paid for the refrigerator ?

- A. \$172.80
- B. \$216.00
- C. \$1972.80
- D. \$2016.00

17. Fifty tickets are sold in a raffle. There are two prizes. Michael buys 5 tickets. Which expression gives the probability that that Michael wins both prizes ?

- A.  $\frac{5}{50} + \frac{4}{50}$
- B.  $\frac{5}{50} + \frac{4}{49}$
- C.  $\frac{5}{50} \times \frac{4}{50}$
- D.  $\frac{5}{50} \times \frac{4}{49}$

18. The table shows monthly repayments for various amounts borrowed, and different interest rates, for a term of 20 years.

Amount borrowed	Monthly repayments			
	5%pa	6%pa	7%pa	8%pa
\$10 000	\$66.00	\$71.64	\$77.53	\$83.64
\$15 000	\$98.99	\$107.46	\$116.29	\$125.47
\$20 000	\$131.99	\$143.29	\$155.06	\$167.29
\$25 000	\$164.99	\$179.11	\$193.82	\$209.11

The total interest paid over 20 years on a loan of \$15 000 at 6% p.a. is

- A. \$1289.52
- B. \$2149.20
- C. \$10 790.40
- D. \$25 790.40

19. Ali buys a television costing \$1494 on interest free terms over 2 years.  
If he pays one third deposit, how much will he be required to pay each month?

- A. \$20.75      B. \$41.50      C. \$43.58      D. \$83.00

20. Debbie has a credit card on which no interest is charged for purchases made during the month until the due date. After this a rate of 0.0437% per day applies on the outstanding balance for each day after the due date.

A section of Debbie's statement for the month of July is shown below.

Opening Balance : \$0.00

Date	Details	Amount
12/07/01	SGIO Insurance	\$215.00
15/07/01	Ticket sales	\$180.00
23/07/01	Eve Dress shop	\$50.00
25/07/01	Snippets Hair Design	\$45.00

Due Date 14/08/01

Daily percentage rate 0.0437%

If Debbie pays her account in full on 20/08/01, how much interest will be charged to her account ?

- A. \$21.41      B. \$1.28      C. \$3.00      D. \$0.56

## Section II

Total Marks 60

Attempt Questions 21–24

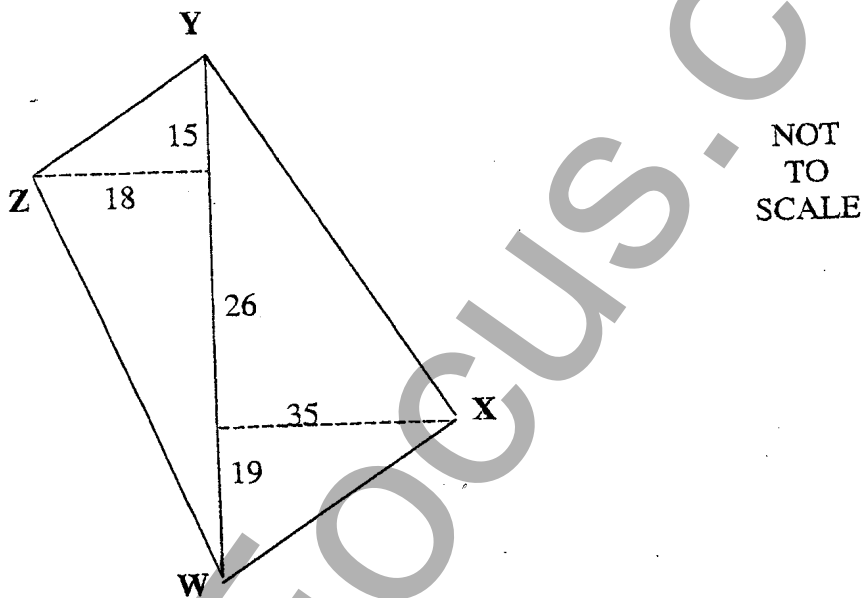
Allow about 1½ hours for this section

Answer each question, starting on a new page.

---

**Question 21** (15 marks) Start a new page.

(a) A traverse survey of a paddock was conducted. A sketch of the paddock is shown.



All the measurements are in metres.

- (i) Draw up an offset survey (notebook entry) of this traverse survey. 2
- (ii) Using the diagram above to calculate the area of the field WXYZ. 2
- (b) The digits 3, 5 and 7 are used to form a three digit number. If no digit can be used more than once;
- (i) List all the possible three digit numbers 1
- (ii) How many possible three digit numbers can be formed if each digit can be used more than once. 1

(c) The following data concerning blood pressure was collected from a large sample of the population.

Blood pressure levels

	Low	Normal	High	Totals
Number of men	1350	8564	3648	13562
Number of women	1290	7593	2861	11744
Totals	2640	16157	6509	25306

- (i) How many males are there in the sample ? 1
- (ii) What percentage of the people with high blood pressure are women ? 1
- (iii) What fraction of the men have normal blood pressure ? 1
- (d) Solve for  $x$  if  $2(x-4)^3 = 54$  2

(e)

Score	Frequency
5	3
6	$k$
7	4
8	9

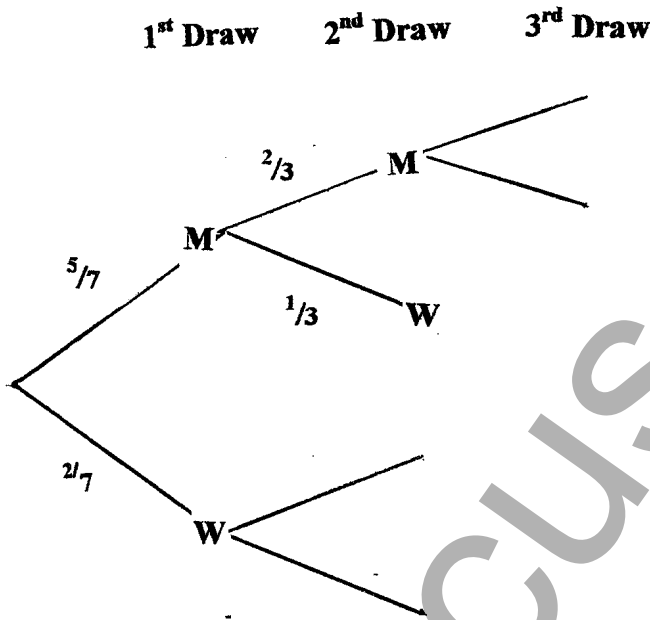
- (i) Write an expression for the mean of this sample 2
- (ii) Find the value of  $k$  if the sum of the scores is 133 ? 1
- (iii) Use  $k$  to find the mean of the distribution. 1

End of Question 21

**Question 22 (15 marks) Start a new page.**

(a) Five men and two women have volunteered to work on a three person committee which is going to be selected at random.

(i) Complete the probability tree for the selection of the committee. Write the probabilities on the branches of the tree.



**2**

(ii) What is the probability that the committee will be all men ? **1**

(iii) What is the probability that it is an all female committee ? **1**

(iv) What is the probability that there will be at most two men on the committee ? **1**

(b) The outstanding balance on a credit card is \$2563.75. If the full balance is not paid by the due date, one months interest will be added to the account. If the rate of interest is 18% p.a. , calculate the amount of interest that will be due if the account is not paid by the due date. **1**



(c) The surface area of a cone is given by the formula  $A = \pi r(r + s)$ , where  $A$  is the surface area;  $r$  = radius of cone;  $s$  = slant height.

(i) Calculate the surface area of a cone with radius of 12cm and a slant height of 20cm. Write the answer correct to 2 decimal places. 1

(ii) Another cone has a surface area of  $3142 \text{ m}^2$  and its base has a radius of 20m. Calculate the slant height to the nearest metre. 2

(d) Kathleen invests \$60 000 at 9% p.a., compounding monthly. Mark, on the other hand, invests \$500 per month at 9% p.a. compounding monthly. They both withdraw their investments at the end of 10 years.

(i) What was Kathleen's investment worth in 10 years time? 1

(ii) Show that Mark's investment is worth \$ 96757.14 at the end of 10 years. 1

(iii) By considering the values of the investments if they are left for longer periods of time, do you think the values of the two investments could ever be the same, if they were left for long enough? 2  
Explain your answer.

(e) Zita is doing an exam and realises that she is almost out of time. There are still ten questions that she has to answer, six are true/false questions and four are multiple choice questions with answers A, B, C or D. If Zita guesses the answers to these last ten questions, calculate the probability that she :

(i) Answers all the true/ false questions correctly. 1

(ii) Answers all the multiple choice questions incorrectly. 1

**The end of Question 22.**

**Question 23** ( 15 marks) Start a new page

(a) The following stem and leaf plot shows a comparison of long jump distances, in centimetres, for boys and girls in an athletics carnival.

Girls		Boys
	54	3
	53	0 2 4 8
2	52	1 1 5 6 9
9 7 4 3 □ 0	51	6 8
6 4 2 2 1	50	

- (i) If the median distance for the girls is 511cm, what value should replace □ ? 1
- (ii) Find the median, upper quartile and lower quartile for the boys distances. 3
- (iii) If the girls distances have a median of 511cm, an upper quartile of 515.5cm and a lower quartile of 503cm, use this information and your results from part (ii) to draw box and whisker plots of the girls and boys distances. 3
- (iv) Compare and contrast the distances jumped by the girls and boys by considering:
- The shape and skewness of the distributions
  - The measures of location and spread. 3
- (b) Given the formula  $b^2 = a^2 (1 - e^2)$ , evaluate  $b$  when  $b$  is positive,  $a = 2.6 \times 10^{15}$  and  $e = 0.62$ , giving your answer in scientific notation correct to 3 significant figures. 2
- (c) Andy borrows \$4 000, which is to be repaid over 4 years at \$110 per month.
- (i) How much interest does he pay over the four years ? 1
- (ii) Calculate the flat rate of interest per annum that Andy has been charged? 2

**End of Question 23**

**Question 24** (15 marks) Start a new page.

(a) Use the guess and refinement technique to solve for  $n$  correct to one decimal place if:

$$18(1.08)^n = 45 \quad 2$$

(b) Maria is investigating a loan of \$80 000. She is considering the options of a 10 year loan or a 15 year loan, both at 11.5% p.a. compounding monthly.

(i) Calculate the monthly loan repayments for both the 10 year and 15 year options. 2

(ii) How much extra will Maria pay, in total, for the 15 year loan over the 10 year loan. 2

(c) If  $D = 5\sqrt{h/2}$ ,

(i) Rearrange the equation to make  $h$  the subject of the equation. 2

(ii) Use your answer in part (i) or otherwise, find  $h$  when  $D = 35$ . 1

(d) The CD player in Richard's car plays tracks from a CD in a random order. Richard inserted a CD with 12 tracks into the player. What is the probability that his two favourite songs on the CD will be the first two songs selected by the CD player. 2

(e) The payment on a loan of \$150 000 over a 20 year term at 9.6% p.a. is \$1408.01 per month.

(i) What is the monthly interest rate paid on the loan? 1

(ii) Use the above information to find the values of  $A$ ,  $B$  and  $C$  in the table below. 2

Month	Principal (P)	Interest (I)	P + I	Balance owing
1	\$150 000	\$1200	\$151 200	\$149 791.99
2	\$149 791.99	\$1198.34	A	\$149 582.32
3	\$149 582.32	B	\$150778.98	\$149 370.97
4	\$149 370.97	\$1194.98	\$150 565.94	C

(iii) How much is paid off the loan at the end of four months? 1

**The end of the paper.**