WINDED 1963	SWISS COTTAGE SECONDARY SCHOOL SECONDARY FOUR MOCK WA2			0
Name:		_ (	)	Class:
MATHEM	ATICS			

Candidates answer on the Question Paper.

## READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

Answer **all** the questions.

If working is needed for any question it must be shown with the answer.

Omission of essential working will result in loss of marks.

The use of an approved scientific calculator is expected, where appropriate.

If the degree of accuracy is not specified in the question and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For  $\pi$ , use either your calculator value or 3.142, unless the question requires the answer in terms of  $\pi$ .

The number of marks is given in brackets [ ] at the end of each question or part question. The total number of marks for this paper is 25.

Qn	Mark	Concept	Application	Careless	Student Analysis/Remarks
1	4				
2	8				
3	9				
4	4				
То	Total Mark 25 Parent's Signature				

This document consists of 9 printed pages.

[Turn over

38 mins

## Mathematical Formulae

**Statistics** 

Mean = 
$$\frac{\sum fx}{\sum f}$$
  
Standard deviation =  $\sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$ 





(a) Use the curve to find

(i) the percentage of students who scored at least 16 marks,

Answer ......% [1]

(ii) the median score,

(iii) the interquartile range.

[1]

(b) Three students were found cheating during the test. Their scores were 13, 17 and 19. The mean score for the test was 25. Given that their scores were removed from the list, describe how this would affect the mean.
Answer



2 Mevin set up a stall at a bazaar selling face masks, hand sanitisers and hand wash.

The selling prices of the items were \$2.50, \$3 and \$4.50 respectively.

The table below shows the quantity of each item sold at different periods of the day over two weeks.

	Week 1			Week 2		
	Face	Hand	Hand	Face	Hand	Hand
	mask	sanitiser	wash	mask	sanitiser	wash
Morning	105	98	71	84	75	12
Afternoon	54	43	20	42	39	35
Evening	161	102	68	93	51	24

The quantity of the items sold for the two weeks can be represented by the matrices

	(105	98	71)		(84	75	12
A =	54	43	20	and $\mathbf{B} =$	42	39	35
	161	102	68)		93	51	24)

(a) Represent the price of each item in a  $3 \times 1$  column matrix **P**.

Answer  $\mathbf{P} = \dots$  [1]

(b) Evaluate the matrix T = (A + B)P.

(c) State what each element in matrix T represents.

Answer
[1]

After observing that his sales dropped in the second week, Mevin decided to lower the price of the face mask, hand sanitiser and hand wash by 10%, 5% and 20% respectively.

(d) Write down a  $3 \times 3$  matrix Q such that QP represents the new prices of each item.

(e) Given that  $\mathbf{R} = \begin{pmatrix} 1 & 1 & 1 \end{pmatrix}$ , evaluate  $\mathbf{S} = \mathbf{R}\mathbf{A}\mathbf{Q}\mathbf{P}$  and state what each element in matrix  $\mathbf{S}$  represents. *Answer* 

S = .....

 [3]

3 (a) Point *A* has coordinates (-2, 1) and  $\overrightarrow{AB} = \begin{pmatrix} 6 \\ 9 \end{pmatrix}$ .

(i) Find the equation of the line *AB*.

(ii) Find  $\overrightarrow{OB}$ .

The points A, B and C are collinear and  $\overrightarrow{AC} = \begin{pmatrix} u \\ 12 \end{pmatrix}$ .

(iii) Find *u*.

(b) PQRS is a trapezium with QR // PS and 3QR = 2PST is a point on QS such that QT : QS = 1:3.  $\overrightarrow{PQ} = \mathbf{p}$  and  $\overrightarrow{QR} = \mathbf{q}$ .

Express each of the following, as simply as possible, in terms of **p** and/or **q**.

(i)  $\overrightarrow{SQ}$ 

Answer  $\overrightarrow{SQ} = \dots$  [1]

(ii)  $\overrightarrow{PT}$ 

Answer  $\overrightarrow{PT} = \dots$ [1]

(iii)  $\overrightarrow{SR}$ 

Answer  $\overrightarrow{SR} = \dots$  [1]

4 (a) The weights of 200 girls in dance academy A were recorded and shown in the table below.

Weight $(x \text{ kg})$	Number of girls
$40 \le x < 45$	25
$45 \le x < 50$	p
$50 \le x < 55$	70
$55 \le x < 60$	50
$60 \le x < 65$	10

## (i) Find *p*.

Answer  $p = \dots$ [1]

(ii) Calculate an estimate of the standard deviation of the weights.

*Answer* ...... kg [1]

(iii) The weights of the girls in dance academy B were recorded.

The median weight was found to be 57 kg.

Make a comparison between the weights of the girls in dance academy *A* and *B*. *Answer* 

[2]

End of paper