



EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS
SPECIMEN PAPER 4 Structured Questions (Extended)

6880/04
October/November 2021
2 hours 30 minutes

Additional Materials: Scientific calculator
Geometric Instruments
Mathematical Tables (optional)
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen in the spaces provided on the Question Paper.

You may use a pencil for any diagrams or graphs.

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

Answer **all** questions.

All working should be clearly shown below each question.

The number of marks is given in brackets [] at the end of each question or part question.

Marks will be given for working which shows that you know how to solve the problem even if you get the answer wrong.

Scientific calculators should be used.

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 π , use either your calculator value or 3.142.

The total of the marks for this paper is 120.

For Examiner's Use

1	
2	
3	
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Total	

This document consists of **16** printed **4** blank pages.

- 1 (a)** The price of a coat was increased from E450 to E520.
Calculate the percentage increase.

Answer (a)% [2]

- (b)** A sum of E420 is to be shared by Sindi and Lindi in the ratio 3:4 respectively.
Calculate how much will Lindi get.

Answer (b) E.....[2]

- (c)** In a sale the price of a television set was reduced by 15%.
A customer paid E510 for the set.
Calculate the original price.

Answer (c)E.....[3]

- (d)** A money lender charges 12% annual compound interest on loans.
A client borrowed E6000.
At the end of the agreed upon period the client paid E8429.57 in total.
Find the period for the loan.

Answer (d).....years[2]

- (e)** y varies inversely as the square of x .
When $x = 7, y = 5$.
Find y when $x = 3$.

Answer(e) $y =$[3]

- 2 (a) Twenty passengers were transported in two types of taxis.
Type A took a maximum of 3 passengers.
Type B took a maximum of 4 passengers.
All taxis had maximum numbers of passengers.
There were 2 more type A taxis than type B taxis.
There were v type A taxis and w type B taxis.

Find the values of v and w .

Answer (a) $v = \dots\dots\dots$, $w = \dots\dots\dots$ [4]

- (b) The equation of a curve is

$$y = 3x^2 - 6x - 7.$$

The gradient of the curve at point $U = 12$.

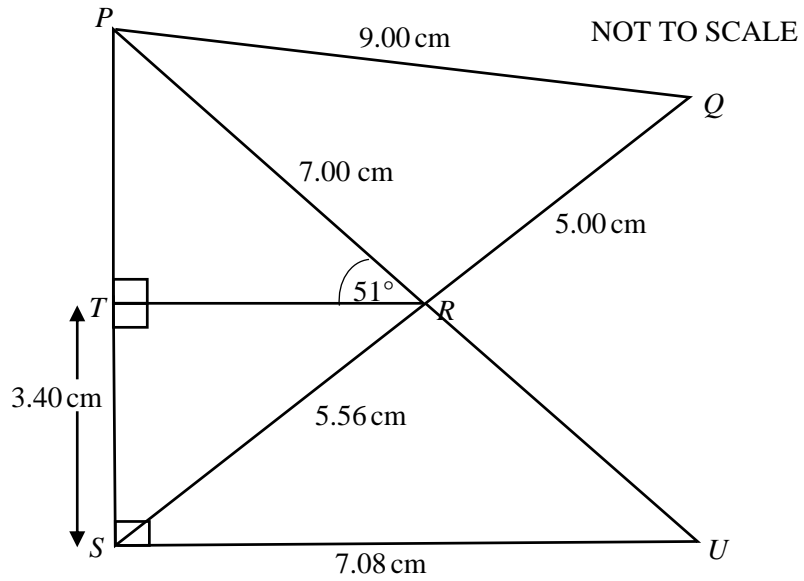
Find the coordinates of U .

Answer (b) ($\dots\dots\dots$, $\dots\dots\dots$) [4]

- (c) The equations of two straight lines are $\frac{y-2}{3} = 2x+1$ and $3y = x + 15$.

Show that the two lines intersect at (0,5) [3]

- 3 (a) Use the diagram to answer the questions that follow.



- (i) Calculate the length of side PT ,

Answer (a)(i) $PT = \dots\dots\dots$ cm [2]

- (ii) Calculate the size of angle TSR ,

Answer (a)(ii) angle $TSR = \dots\dots\dots^\circ$ [2]

- (iii) Calculate the size of angle RPQ .

Answer (a)(iii) angle $RPQ = \dots\dots\dots^\circ$ [4]

- (iv) Calculate the area of triangle RSU .

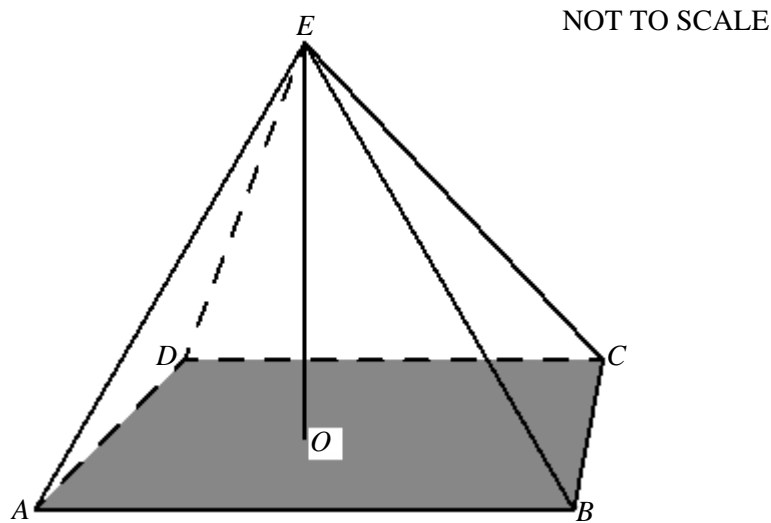
Answer (a)(iv) area =cm² [2]

- (b) $ABCDE$ is a square-based pyramid.

The length of each side of the square is 4.3 cm.

The height OE of the pyramid is 6.2 cm.

Volume of a pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$



- (i) Calculate the angle between edge BE and the base $ABCD$.

Answer (b)(i)..... °[4]

- (ii) Find the volume of the pyramid.

Answer (b)(ii).....cm³ [2]

- 4 Three bags contain green and white balls of the same size.
 Bag A has 2 green balls and 3 white balls.
 Bag B has 3 green balls and 1 white balls.
 Bag C has 6 green balls and x white balls

(a) A ball is drawn at random from **bag B**.

State the probability that

(i) the ball is white,

Answer (a)(i).....[1]

(ii) the ball is red.

Answer (a)(ii).....[1]

(b) The probability of getting a green ball from **bag C** is $\frac{3}{7}$.

(i) State the probability of getting a white ball.

Answer (b)(i).....[1]

(ii) Find the number of white balls.

Answer (b)(ii).....[1]

(c) A ball is drawn from each of bags A and B.

Draw a possibility space diagram for the two draws on the grid.

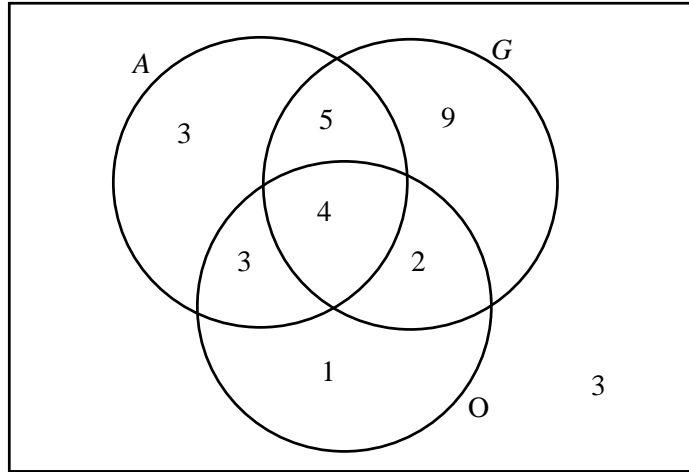
[2]

(d) Use the possibility space diagram to find the probability that the balls are of different colours.

Answer (d).....[1]

- (e) A group of 30 participants were asked which type of fruit drink they liked from orange, guava or apple.

The results are shown in the Venn diagram.



- (i) A participant is chosen from the group.
Find the probability that they liked guava juice.

Answer (e)(i).....[1]

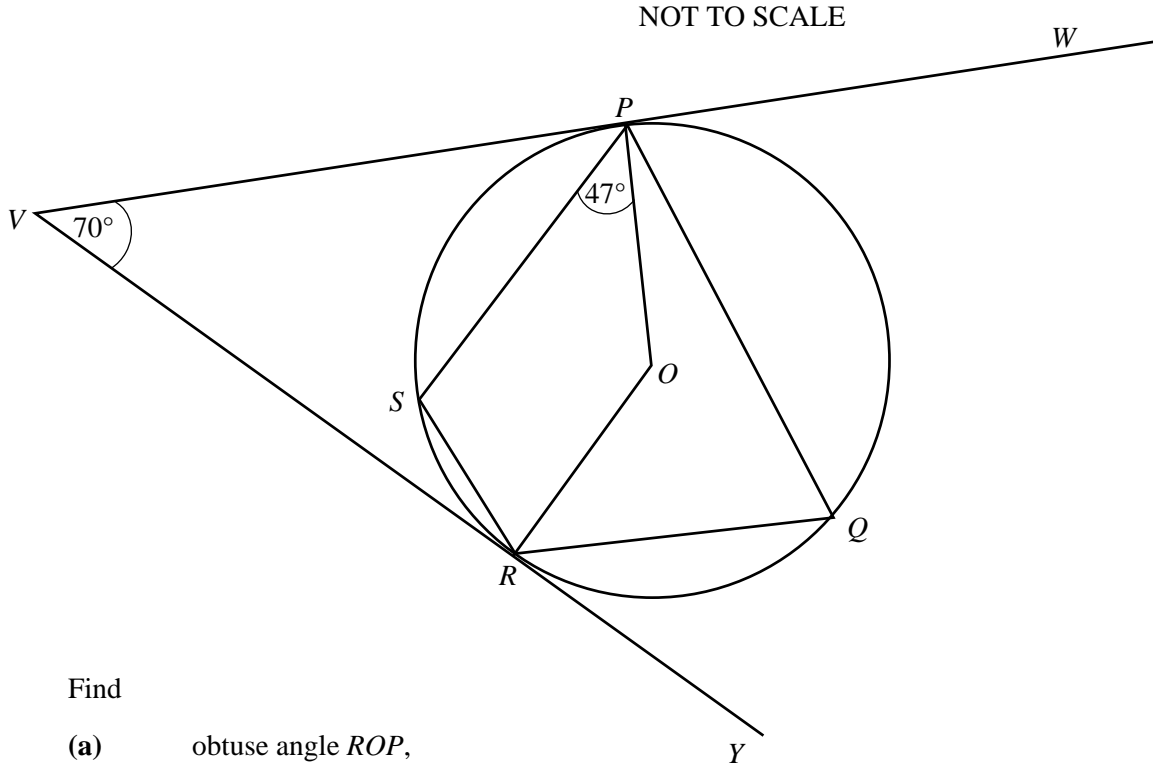
- (ii) A participant is chosen from those that liked juices.
Find the probability that they liked more than one juice.

Answer (e)(ii).....[2]

- (iii) A participant is chosen from those that liked apple juice.
Find the probability that they liked they more than one juice.

Answer (e)(iii).....[2]

- 5 In the diagram VW and VY are tangents to the circle at P and R respectively.
 O is the centre of the circle.
 Angle $RVP = 70^\circ$.
 Angle $SPO = 47^\circ$.



Find

- (a) obtuse angle ROP ,

Answer(a) angle ROP°[2]

- (b) angle PQR ,

Answer(b) angle PQR =° [1]

- (c) angle PSR ,

Answer (c) angle PSR =.....°[1]

- (d) angle VRS .

Answer (d) angle VRS =°[3]

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6 (a) Solve

(i) $17 - 2x = 3,$

Answer (a)(i) $x = \dots\dots\dots$ [2]

(ii) $\frac{x-1}{2} - \frac{3}{5} = \frac{2x}{3}$

Answer (a)(ii) $x = \dots\dots\dots$ [3]

(b) Make v the subject.

$$2w + kv = 5$$

Answer (b) $v = \dots\dots\dots$ [2]

(c) Factorise

(i) $3v - 18,$

Answer (c)(i) $\dots\dots\dots$ [1]

(ii) $2x^2 - 4x - 70.$

Answer (c)(ii) $\dots\dots\dots$ [3]

- (d) The area of a rectangle = $4y \text{ cm}^2$.
The perimeter of the rectangle = $(2y + 2) \text{ cm}$.
The length of the rectangle is $(x + 3) \text{ cm}$.
The width of the rectangle is $(x + 2) \text{ cm}$.

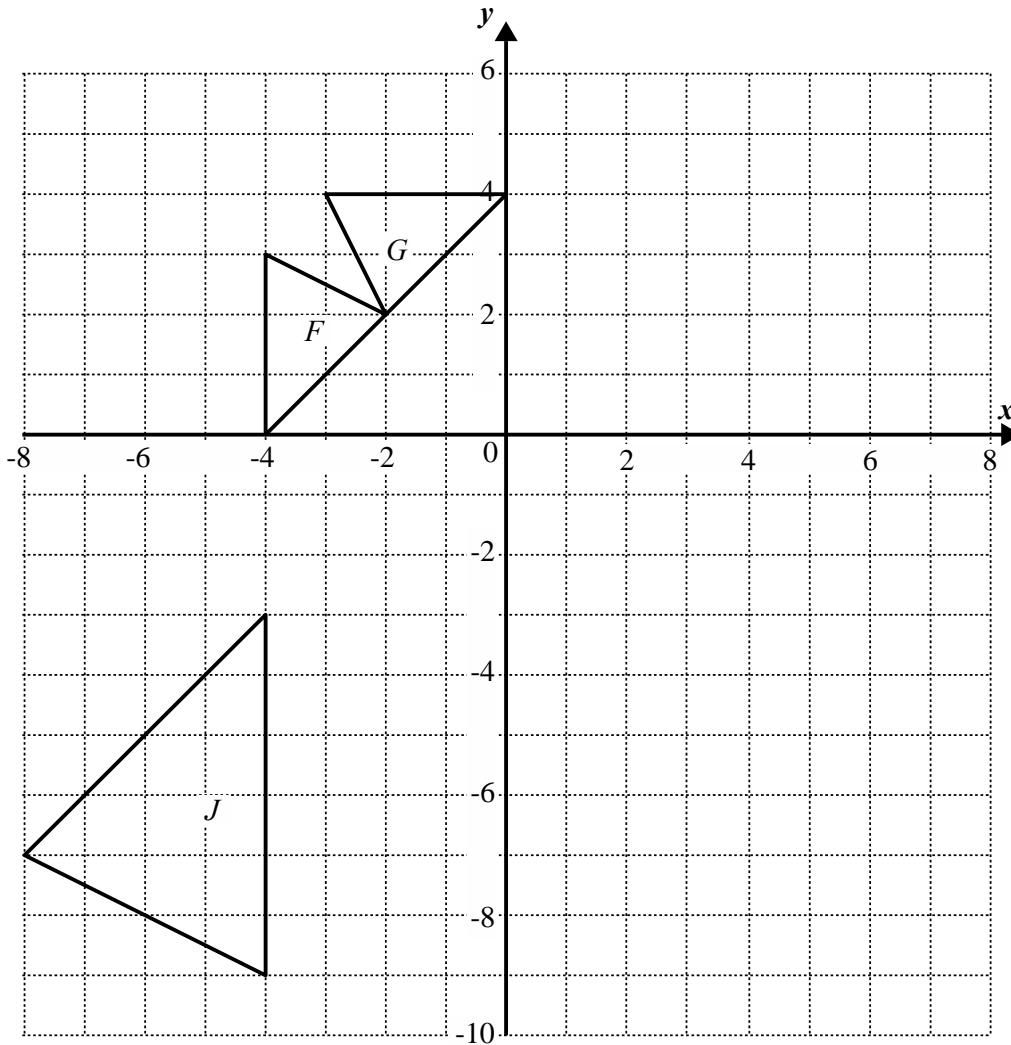
- (i) Form and solve two equations to find the values of x .

Answer (d)(i) $x = \dots\dots\dots$, $x = \dots\dots\dots$ [6]

- (ii) Hence calculate the length of the diagonal.

Answer (d)(ii) $\dots\dots\dots$ cm [2]

7 The diagram shows triangles F, G and J.



(a) Reflect triangle *G* in the line $x = 2$.
Label the image *H*. [2]

(b) Describe the **single** transformation that
(i) maps triangle *F* onto triangle *J*,

Answer (b)(i).....[3]

(ii) maps triangle *F* onto triangle *G*.

Answer (b)(ii).....[2]

- (c) Rotate triangle G with centre $(0,0)$ and angle 180° .
Label the image K [2]

- (d) Describe the **single** transformation that maps triangle F onto triangle K .

Answer (d).....
.....[2]

- (e) Triangle F is mapped onto triangle L by a transformation represented by the matrix

$$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}.$$

- (i) On the grid, draw triangle L . [3]

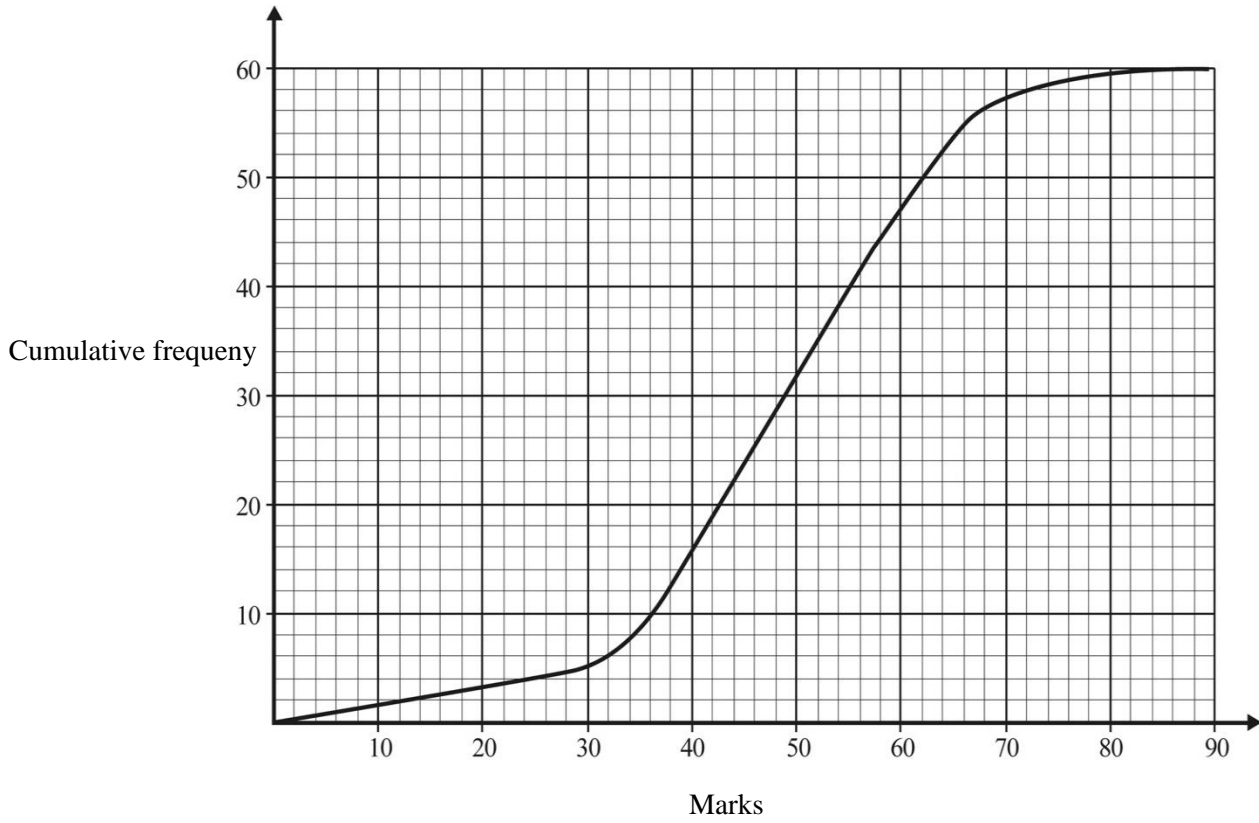
- (ii) Describe fully the **single** transformation represented by the matrix $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$.

Answer(e)(ii).....
.....[3]

- (f) Find the matrix that represents a reflection in the line $y = x$.

Answer (f) $\left(\begin{array}{cc} & \\ & \end{array} \right)$ [2]

- 8 On the grid is a cumulative frequency curve for the marks obtained by 60 learners. The test was marked out 90.



(a) Use the graph to find the estimate of the

(i) median,

Answer (a)(i)[1]

(ii) interquartile range,

Answer (a)(ii)[2]

(iii) number of learners that got more than 40 marks.

Answer (a)(iii)[2]

- (b) You are given that 50 was the pass mark.
Use your graph to find the number of learners that passed the test.

Answer (b)[2]

- (c) A distribution is given below.

17 25 13 39 11 22 15

Find

- (i) the median,

Answer (c)(i)[1]

- (ii) the mean.

Answer (c)(ii) [2]

- (d) The shoe sizes for 40 learners were recorded.
A pie chart is to be drawn for these results.

Shoe size	Size 6	Size 7	Size 8	Size 9	Size 10
Number of learners	5	11	a	8	7
Sector angle ($^{\circ}$)	p	99	q	72	63

Find the values of a , p and q

Answer (d) $a =$, $p =$, $q =$[3]

9 You are given that $f(x) = 1 - 2x$, $g(x) = 3x + 2$ and $h(x) = 2x^2$.

(a) Work out $f(-7)$.

Answer(a).....[1]

(b) Find $g^{-1}(x)$.

Answer (b)[2]

(c) Find, in simplest forms, expressions for $k(x)$ given that:

$$hk(x) = 2x^2 + 4x + 2,$$

Answer (c).....[3]

(d) Solve for x given that

$$(f(x))^2 = 2h(x).$$

Answer (d) $x =$ [3]

- (e) Find the value of x given that

$$f^{-1}(x) = 9.$$

Answer (e) $x = \dots\dots\dots$ [2]

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