EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

MATHEMATICS **6880/04**

Paper 4 Structured Questions (Extended) **October/November 2022**

2 hours 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided.

Write in dark blue or black pen in the spaces provided on the Question paper.
You may use an HB pencil for any diagrams or graphs.
Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

If working is needed for any question it must be shown below that question.
The number of marks is given in brackets [ ] at the end of each question **or** part question.

Electronic 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	
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This document consists of **20** printed pages.

1 Solve

(a) $15 - 2x < 19$,

Answer (a) ..... [2]

(b) $\frac{t-2}{4} + \frac{t+5}{3} = 7$,

Answer (b) $t =$ ..... [3]

(c) $(x + 5)(x - 4) = 0$.

Answer (c) $x =$ ..... or $x =$ ..... [2]

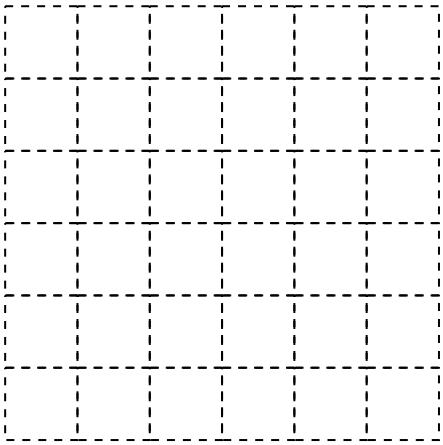
2 A basket contains 3 green apples and 2 red apples.
A boy picks an apple at random from the basket.

(a) Find the probability that the apple is green,

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

(b) He replaces the apple and picks an apple at random for a second time.

(i) Draw a possibility space diagram to show all possible outcomes of the two picks.



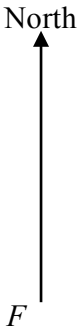
[2]

(ii) Find the probability that the first apple is green and the second one is red.

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

3 A ship leaves port F on a bearing of 065° and sails for 160 km to port G.
It then leaves port G on a bearing of 130° and sails 110 km to port H.

(a) Make a scale drawing of the journey.
Use a scale of 1 cm to represent 20 km.



[4]

(b) Use the scale drawing to find

(i) The actual distance between port F and port H in kilometres,

Answer (b)(i) ..... km [2]

(ii) The bearing of port F from port H.

Answer (b)(ii) ..... ° [2]

4 **(a)** You are given that $f(x) = 1 - 2x$ and $g(x) = \frac{x}{4}$.

Find

(i) $f(-2)$,

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

(ii) $gf(1)$,

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

(iii) $f^{-1}(7)$.

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

(b) $h(x) = \frac{x+3}{2}$

Find $h^{-1}(x)$.

Answer (b) $h^{-1}(x) =$ ..... [2]

5 A farmer grows and sells potatoes.

The selling price is always 20% more than the cost price of the farm inputs.

(a) In 1991, the selling price was E540.

Calculate the cost price of the farm inputs.

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

(b) In 1992, the cost price increased to E495.

(i) Calculate the selling price in 1992.

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

(ii) Calculate the percentage increase of the selling price from 1991 to 1992.

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

(c) The farmer was taxed according to the table below.

Taxable Earnings	Rate of tax
Exceeds E45 000 but does not exceed E90 000	E8 500 + 27.5% of the amount by which the taxable earnings exceed E45 000

A farmer paid a tax of E9 558.75.

Calculate the amount the farmer earned.

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

(d) The farmer pays his sales agent commission in the ratio

Commission: Sales = 1 : 20.

The sales agent was paid E 556.57.

Calculate the amount of sales the agent made.

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

6 **(a)** Factorise the following.

(i) $10x^2 + 17x + 3$

Answer (a)(i) ..... [2]

(ii) $8x^2 - 18y^2$

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

(b) Solve.

(i) $3x - 9 = 0$

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

(ii) $x + 3 \geq 7 - x$

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

(iii) $x^2 + 6 = 5x$

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

(iv) $x^2 = 17$

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

(c) Rearrange $y = 2(x - 3)^2 - 9$ to make x the subject.

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

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7 A regular n-sided polygon has each exterior angle $2x°$.

(a) Use the sum of exterior angles to show that $x = \frac{180}{n}$.

[1]

(b) The sum of the interior angles of the polygon is 3240°.

Show that $x = 90 - \frac{1620}{n}$.

[3]

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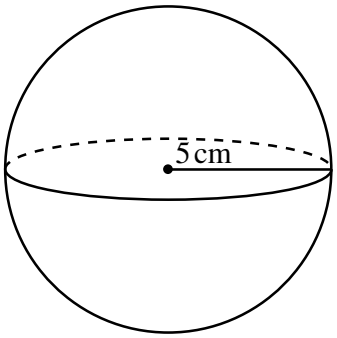
8 There are five identical balls made of wax.

Each ball is a sphere of radius 5 cm.



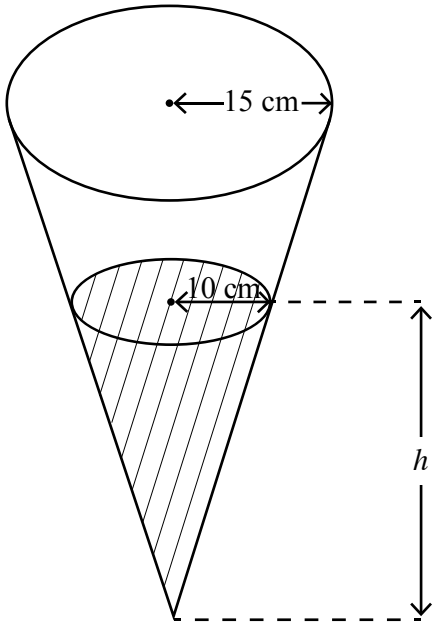
(a) Calculate the volume of each ball.

[Volume a sphere = $\frac{4}{3}\pi r^3$]

Answer (a) ..... cm^3 [2]

(b) The five balls are melted and poured into a container.

The shape of the container is a cone of radius 15 cm.
The depth of the wax is h cm and radius 10 cm.



Calculate the height, h, of the liquid in the container.

[Volume of a cone $= \frac{1}{3}\pi r^2 h$]

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

(c) The cone-shaped container has a radius of 15 cm.

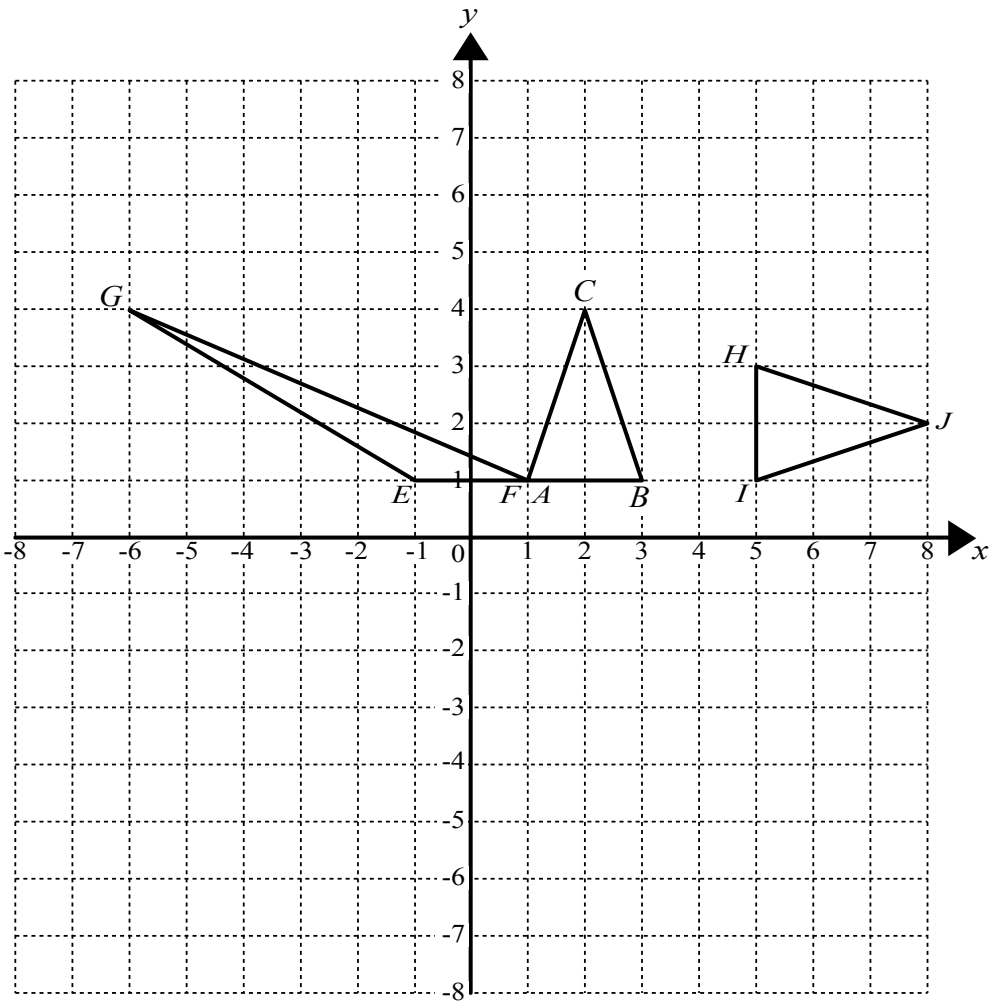
(i) Calculate the volume of the container.

Answer (c)(i) .....cm^3 [3]

(ii) Calculate the **total** number of wax balls that needed to be melted to fill up the container.

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

9 The diagram shows triangles *ABC*, *EFG* and *HIJ*.



(a) Describe fully, the **single** transformation that maps

(i) triangle *ABC* onto triangle *EFG*,

Answer (a)(i) .....

.....

.....

..... [3]

(ii) triangle *ABC* onto triangle *HIJ*.

Answer (a)(ii) .....

.....

..... [3]

(b) Triangle *ABC* is mapped onto triangle *KLM* by a reflection in the line $y = -1$.

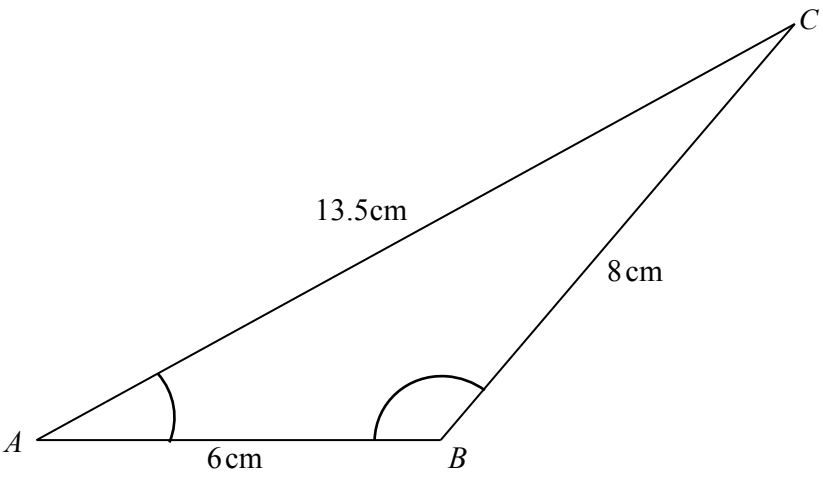
Draw and label triangle *KLM*. [2]

(c) Triangle *ABC* is mapped onto triangle *EFG* by matrix T.

Find the matrix T.

Answer *(c)* $T = \begin{pmatrix} & \\ & \end{pmatrix}$ [2]

10 The diagram shows triangle ABC.
$AB = 6\,\text{cm}$, $BC = 8\,\text{cm}$ and $AC = 13.5\,\text{cm}$.
$A\hat{B}C$ is obtuse.



NOT TO SCALE

(a) Show that $B\hat{A}C = 17.79°$ correct to 2 decimal places.

[4]

(b) Calculate the obtuse $A\hat{B}C$.

Answer (b) .....° [4]

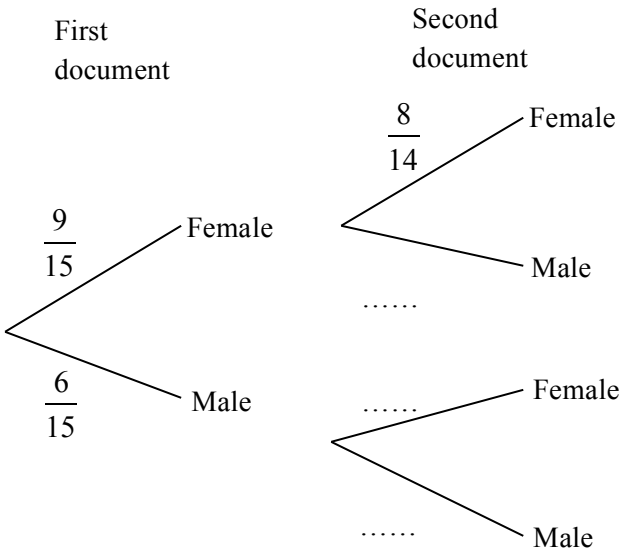
(c) Calculate the area of triangle ABC.

Answer (c) .....cm^2 [2]

11 A cross-border minibus driver received 15 travel documents from his passengers.
There were 9 female and 6 male passengers in the minibus.
The driver randomly picked one travel document at a time for stamping.

(a) The tree diagram shows the probabilities of picking the first two travel documents.

Complete the tree diagram.



[2]

(b) Calculate the probability that

(i) both documents are for female passengers,

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

(ii) one document is for a male passenger and the other document is for a female passenger.

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

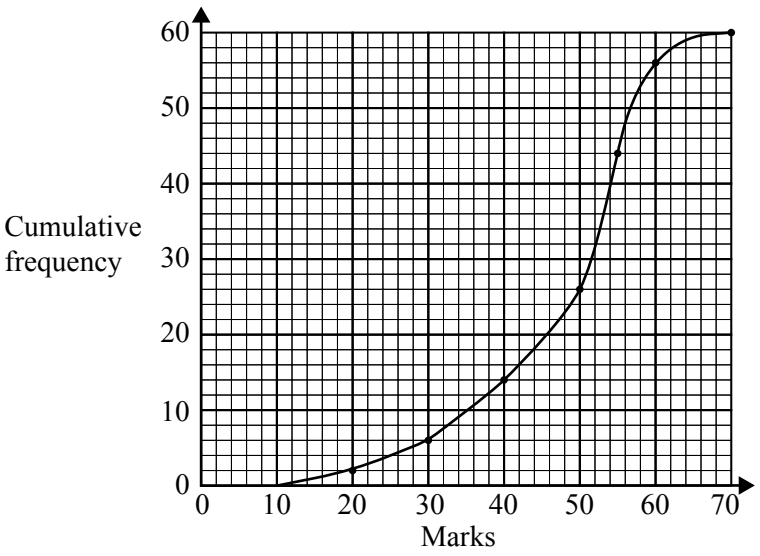
(c) Calculate the probability that the first four travel documents will be for female passengers only.

Answer (c) ..... [2]

(d) Write down the probability that the first 7 documents will be documents for male passengers only.

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

12 The cumulative frequency curve shows the marks for 60 learners in a test marked out of 70.



(a) Use the cumulative curve to find

(i) the median,

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

(ii) the interquartile range,

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

(iii) the percentage of the learners who passed the test if the pass mark was 42.

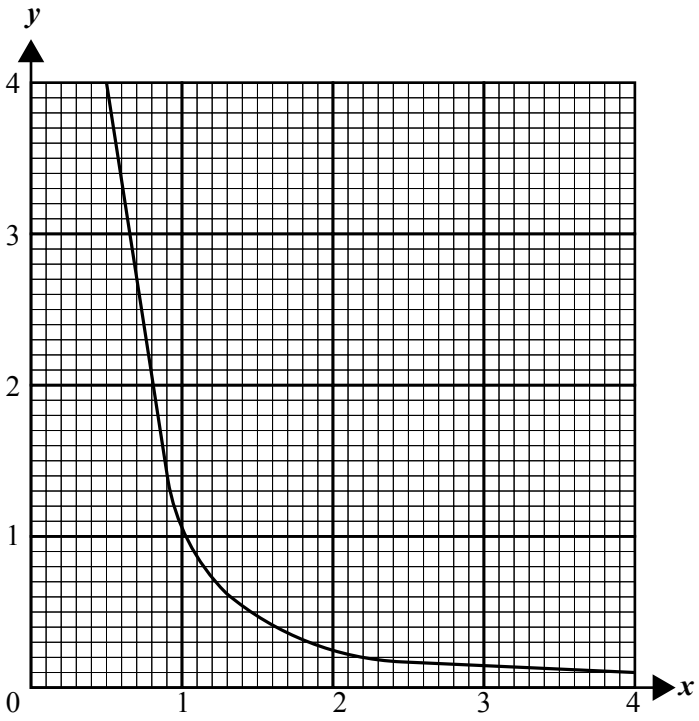
Answer (a)(iii) ..... [3]

(b) Complete the frequency table.

Marks (m)	$10<m\leqslant 20$	$20<m\leqslant 30$	$30<m\leqslant 40$	$40<m\leqslant 50$	$50<m\leqslant 55$	$55<m\leqslant 60$	$60<m\leqslant 70$
Frequency	2	4		12		14	

[3]

13 The graph below is for $y = \frac{1}{x^2}$, $0 < x \leq 4$.



(a) By drawing a tangent, find the gradient of the curve at $x = 1$

Answer (a) gradient = ... [2]

(b) (i) Use the graph to solve the equation $\frac{1}{x^2} = 2.5$.

Answer (b)(i) $x =$ ..... [1]

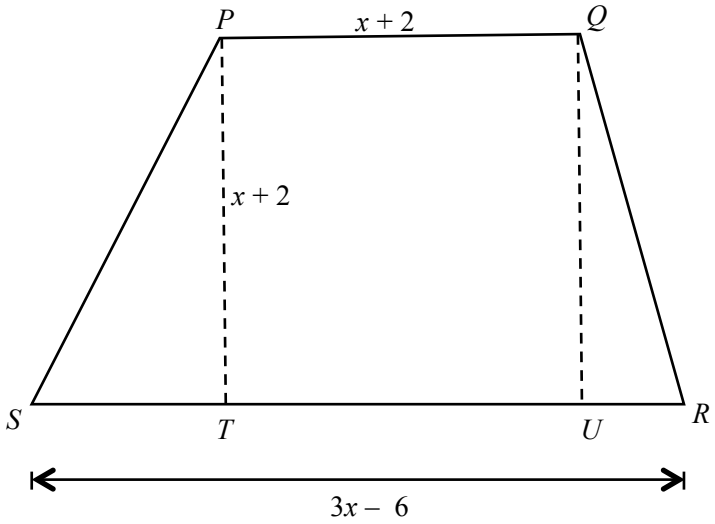
(ii) By drawing a suitable line, use the graph to solve $\frac{2}{x^2} = 4x - 2$.

Answer (b)(ii) $x =$ ..... [3]

[Turn over

14 PQRS is a trapezium.

STUR is a straight line.
PQUT is a square.
PQ = PT = $(x + 2)$ cm.
SR = $(3x - 6)$ cm.



The area of $PQUT = 81\,\text{cm}^2$.

(a) Form and solve an equation to find the value of x.

Answer (a) $x =$ ..... [2]

(b) Hence or otherwise find the area of trapezium $PQRS$.

Answer (b) ..... cm^2 [3]