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 2021**

2 hours 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Geometrical Instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

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

This document consists of **18** printed pages and **2** blank pages.

1 You are given the distribution

43 78 11 93 25 64 53.

Find the

(a) Median,

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

(b) Mean

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

(c) Range.

Answer (c) ..... [1]

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2 Simplify

(a) $1 - 2x + 5x + 3v$,

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

(b) $\frac{y}{3} - \frac{2y}{5}$,

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

(c) $\frac{6}{z} - \frac{11}{2z}$.

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

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3 You are given

$$K = \begin{pmatrix} 3 & 5 \\ -1 & 2 \\ 7 & 2 \end{pmatrix}, \quad L = \begin{pmatrix} 11 & 1 \\ 4 & -5 \\ 0 & 9 \end{pmatrix}, \quad M = \begin{pmatrix} 6 & -2 & 4 \\ 11 & -8 & 3 \end{pmatrix}, \quad P = \begin{pmatrix} 1 \\ -7 \\ 2 \end{pmatrix} \text{ and } Q = (3 \quad 1 \quad 4).$$

Work out.

(a) $L - K$

Answer (a) [2]

(b) 2M

Answer (b) [2]

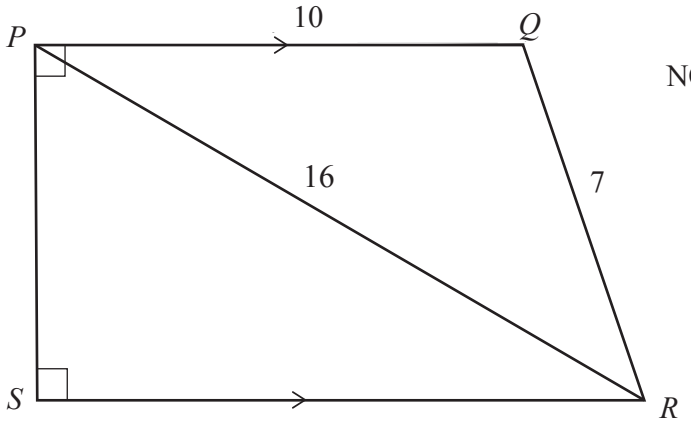
(c) PQ

Answer (c) [2]

(d) QP

Answer (d) [2]

4 **(a)** $PQRS$ is a trapezium.
Angle PSR and angle QPS are right angles.
$PQ = 10$ cm, $QR = 7$ cm and $PR = 16$ cm



NOT TO SCALE

(i) Show that angle $QPR = 16.4°$ correct to 1 decimal place. [3]

(ii) Calculate the size of obtuse angle PQR.

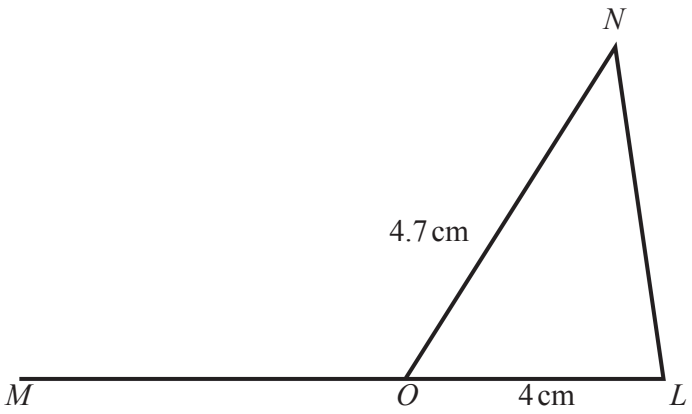
Answer (a)(ii) ..... ° [3]

(iii) Find the length of side SR.

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

(b) The diagram shows triangle LON.
LOM is a straight line.
$NO = 4.7\,\text{cm}$ and $OL = 4\,\text{cm}$.

NOT TO SCALE



You are given that the area of triangle $LON = 7.94\,\text{cm}^2$.

Find angle MON.

Answer (b) ..... ° [3]

5 A cylinder has a volume of 11π cm3.
The radius of the cylinder is $(x + 1)$ cm.
The height of the cylinder is 4 cm.

(a) Form an equation and show that it reduces to

$$4x^2 + 8x - 7 = 0.$$

[3]

(b) Solve $4x^2 + 8x - 7 = 0$.

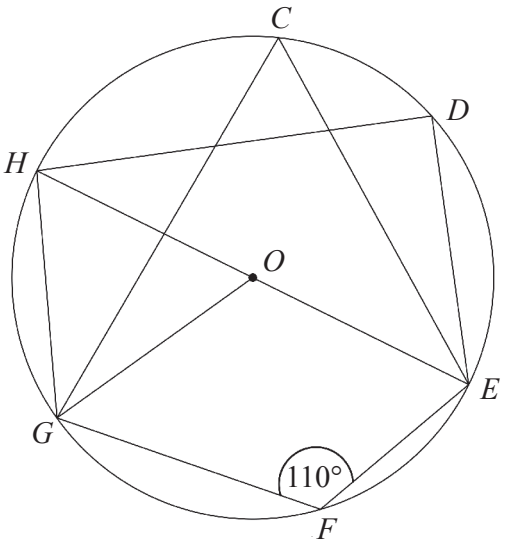
Write your answers to two decimal places.

Answer (b) $x =$ ..... or $x =$ ..... [4]

(c) Hence find the radius of the cylinder.

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

6 In the circle O is the centre.
HOE is a straight line.
Angle $GFE = 110°$



Find

(a) angle HDE,

Answer (a) ..... ° [1]

(b) angle GCE,

Answer (b) ..... ° [1]

(c) angle GHO,

Answer (c) ..... ° [2]

(d) angle GOE,

Answer (d) ..... ° [2]

(e) angle HOG.

Answer (e) ..... ° [1]

7 A dealer sells two types of washing powder.
The washing powders come in 2 kg packets.
Brand A costs him E80 per packet.
Brand B costs him E60 per packet.
Let x represent the number of type A packets and y the number of type B packets.

(a) Write an inequality to illustrate each of the following.

(i) He is allowed to buy a maximum of 25 packets altogether.

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

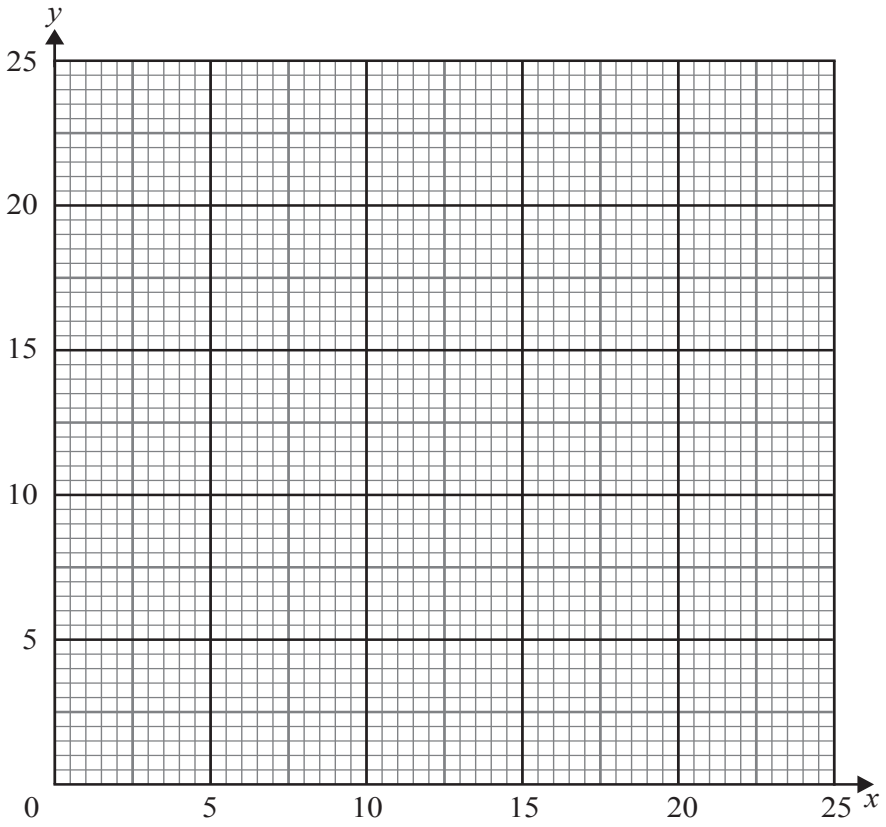
(ii) He always buys more packets of type B than type A.

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

(iii) To get free transport the dealer has to spend more than E1200.

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

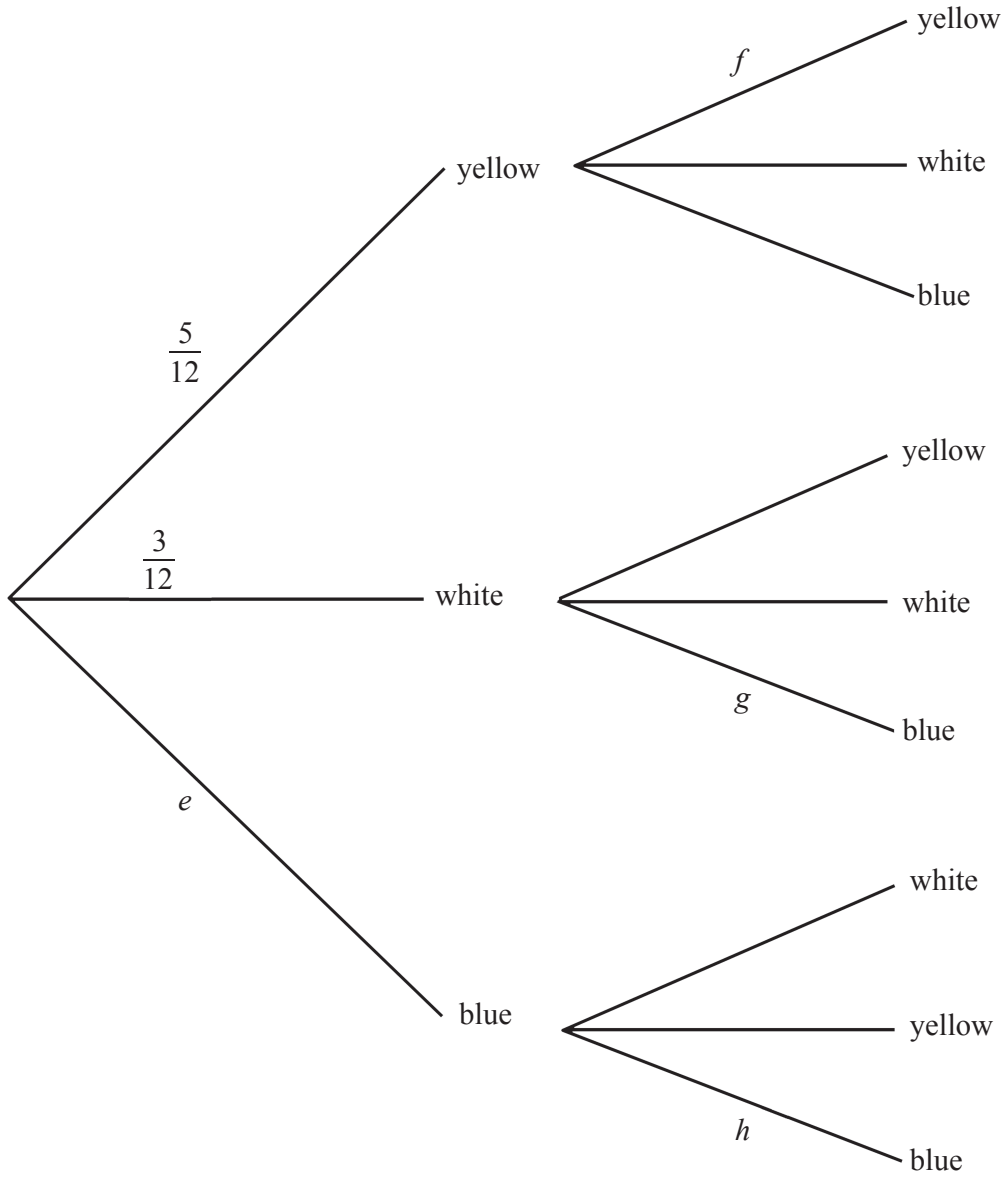
(b) Show these inequalities on a graph by shading the unwanted regions. [3]



(c) Use your graph to find the maximum amount he can spend.

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

8 A bag contains 12 identical balls.
There are 5 yellow balls, 3 white balls and 4 blue balls.
Two balls are picked out at random.
The possible outcomes are shown in the tree diagram.



(a) Find the values of e, f, g and h.

Answer (a) e = ..., f = ... g = ... h = ... [2]

(b) Calculate the probability that

(i) the balls will be of the same colour.

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

(ii) exactly one ball will be blue.

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

(c) The balls are replaced.
Four balls are now picked out at random.

Calculate the probability that they will be of the same colour.

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

9 Solve the equations

(a) $2x - \frac{12}{x} = 5$,

Answer (a) $x =$ ..... or $x =$ ..... [4]

(b) $\frac{\sqrt{y+5}}{6} = 17$.

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

10 You are given points $A(-5, 4)$, $B(-7, 10)$ and $C(0, -3)$,

(a) The equation of line R is $y = 5x + 7$.

Write down the equation of the line perpendicular R passing through point C .

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

(b) Find the midpoint of points A and B.

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

(c) Calculate the distance between the points A and C.

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

11 **(a)** You are given that $2x^2 + 3x - 7 = 0$.

Show that $2x^2 + 3x - 7 = 0$ can be written in the form

$$\left(x + \frac{3}{4}\right)^2 = \frac{65}{16}.$$

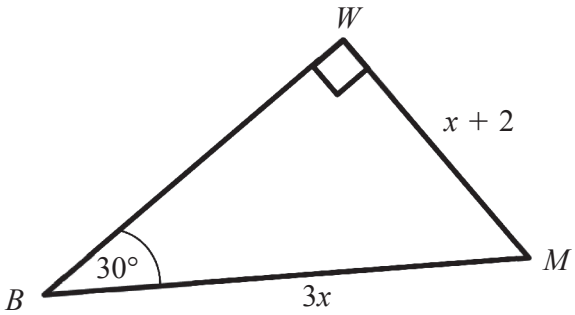
[3]

(b) The length of a rectangle is l cm and the width is b cm.
The numerical value of the area in square centimetres is equal to the numerical value of the perimeter in centimetres.

Form an equation to represent l in terms of b.

Answer (b) $l =$ ..... [2]

(c) In the triangle BMW, the angle BWM is a right angle.



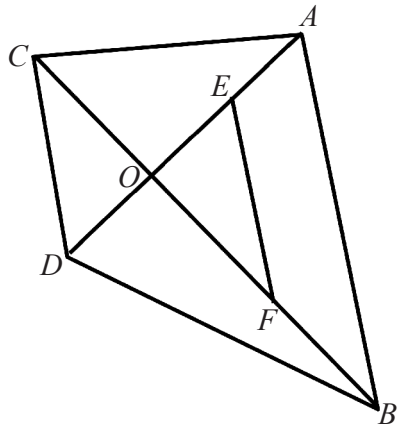
(i) Form and solve an equation in x.

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

(ii) Hence or otherwise, find the length of BW.

Answer (c)(ii) $MW =$ ..... [3]

12 The figure shows quadrilateral $ABCD$.
$COFB$ and $DOEA$ are straight lines.
$DO : OE : EA = 1 : 1 : 1$.
The ratio of the lengths $CO : OF : FB = 1 : 1 : 1$.
$\overrightarrow{OA} = 2\boldsymbol{a}$, $\overrightarrow{OB} = 2\boldsymbol{b}$.



(a) Show that triangles DOC and EOF are congruent.

Answer (a) .....

.....

.....

.....

.....

..... [3]

(b) The area of triangle DOC is 5 square units.

Find the area of triangle AOB.

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

(c) Show that $\overrightarrow{EF}$ is parallel to $\overrightarrow{AB}$.

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

13 (a) (i) In triangle UVW, $UV = 6$ cm, $VW = 7$ cm and $UW = 11$ cm.

Using your ruler and compasses, construct triangle UVW. [2]

(ii) measure angle UWV.

Answer (a)(ii) ..... ° [1]

(b) (i) The perimeter of a triangle ADN is 19 cm.
The length of side AD is twice the length of side ND.
Side NA is 3 cm longer than side ND.
The length of side $ND = x$ cm.

Form an equation and solve it to find the value of x.

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

(ii) Hence write down the length of side NA.

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

14 **(a)** Solve the equations.

(i) $2\cos z - 2 = -1$ for $0° < z < 360°$

Answer (a)(i) $z =$ ..... ° and $z =$ ..... ° [4]

(ii) $b - 2bh = 0$

Answer (b)(ii) $b =$ ..... and $h =$ ..... [3]

(b) Point A is on the curve $y = 2x^2 - 8x - 12$.
The equation of the tangent to the curve at A is $y = 8x - 44$.

Work out the coordinates of A.

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

End]

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