ANGLICAN HIGH SCHOOL
SECONDARY FOUR
PRELIMINARY EXAMINATION 2022

S4

> **SOLUTIONS**

MATHEMATICS   **4048/01**
Paper 1   **25 August 2022**
Candidates answer on the Question Paper.   **2 hours**

READ THESE INSTRUCTIONS FIRST
Write your name, index number and class in the space at the top of this page.
Write in dark blue or black pen.
You may use a HB pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters and 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 π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

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 80.

For Examiners' Use

Question	1	2	3	4	5	6	7	8	9
Marks									
Question	10	11	12	13	14	15	16	17	18
Marks									
Question	19	20	21	22	23	24	25		
Marks									

Table of Penalties	Units		**80**
	Clarity / Logic		
	Accuracy / Precision		
Parent's Name and Signature:			
Date:			

This document consists of **17** printed pages.

Secondary Four Mathematics Preliminary Examination 2022

Mathematical Formulae

Compound Interest

$$\text{Total amount} = P\left(1 + \frac{r}{100}\right)^n$$

Mensuration

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

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

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Area of triangle } ABC = \frac{1}{2}ab \sin C$$

$$\text{Arc length} = r\theta, \text{ where } \theta \text{ is in radians}$$

$$\text{Sector area} = \frac{1}{2}r^2\theta, \text{ where } \theta \text{ is in radians}$$

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Statistics

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

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

1 Calculate $\dfrac{-12.2^2}{3.15-\sqrt{17}}$ and correct your answer to 4 significant figures.

1	= 152.95359	
	= 153.0 (4s.f)	B1

Answer ……………………...... [1]

2 Rearrange the formula $y = \dfrac{x^2-2}{(x-2)(x+2)}$ to make x the subject.

2	$y = \dfrac{x^2-2}{(x-2)(x+2)}$	
	$y(x^2-4) = x^2-2$	M1: for expansion
	$yx^2 - x^2 = 4y-2$	
	$x^2 = \dfrac{4y-2}{y-1}$	M1: for grouping
	$x = \pm\sqrt{\dfrac{2(2y-1)}{y-1}}$	A1: not given without the plus/minus Accept if never factorise out 2.

Answer …………………… [3]

3 Solve the equation $3 - \dfrac{2x-3}{5} = \dfrac{2x+15}{7}$.

3	$3 - \dfrac{2x-3}{5} = \dfrac{2x+15}{7}$	
	$\dfrac{15-(2x-3)}{5} = \dfrac{2x+15}{7}$	M1 for forming algebraic fraction on either side
	$\dfrac{18-2x}{5} = \dfrac{2x+15}{7}$	
	$126 - 14x = 10x + 75$	M1 for cross multiply and form the linear equation
	$24x = 51$	
	$x = \dfrac{51}{24}$	
	$x = \dfrac{17}{8}$ or $2\dfrac{1}{8}$ or 2.125	A1

Answer $x = $ ………………… [3]

Secondary Four Mathematics Preliminary Examination 2022

4 The area of triangle *ABC* is 36.7cm². The length of *AB* is 14.2cm and *BC* is 6.1cm.
Find the possible values of angle *ABC*.

4	$\frac{1}{2}(14.2)(6.1)\sin A\hat{B}C = 36.7$	
	$\sin A\hat{B}C = 0.847379$	
	$A\hat{B}C = \sin^{-1} 0.847379$	
	$= 57.9277° \text{ or } 180° - 57.9277°$	
	$= 57.9° \text{ or } 122.1°$	B2: 1 mark for each answer

Answer Angle *ABC* = ………… ° or ….……… ° [2]

5 Simplify $\left(\dfrac{8p^6}{27m^3}\right)^{-\frac{1}{3}}$.

5	$\left(\dfrac{8p^6}{27m^3}\right)^{-\frac{1}{3}}$	
	$= \left(\dfrac{27m^3}{8p^6}\right)^{\frac{1}{3}}$	M1 for making index form positive
	$= \dfrac{27^{\frac{1}{3}} m}{8^{\frac{1}{3}} p^2}$	
	$= \dfrac{3m}{2p^2}$	A1

Answer …......………………… [2]

6 **(a)** Express 1134 as a product of its prime factors.

6(a)	$1134 = 2 \times 3^4 \times 7$	B1

Answer …………………… [1]

(b) Find the smallest integer value of *k* such that $\dfrac{1143}{k}$ is a perfect cube.

6(b)	$\dfrac{1134}{k} = \dfrac{2 \times 3^4 \times 7}{2 \times 3 \times 7}$ is a perfect cube	
	Therefore $k = 2 \times 3 \times 7$	
	$= 42$	B1

Answer k = …………..……… [1]

(c) A perfect square number less than 150 has exactly 7 factors. List the factors.

6(c)	The number is 64	B1 if 64 is listed.
		B1 for correct
	Factors of 64 are 1,2,4,8,16,32,64	list

Answer ……………..……… [2]

7   Based on the pie chart drawn, Audrey concluded that boys did better than the girls in the Mathematics Common Test. Do you agree? Justify your answer.
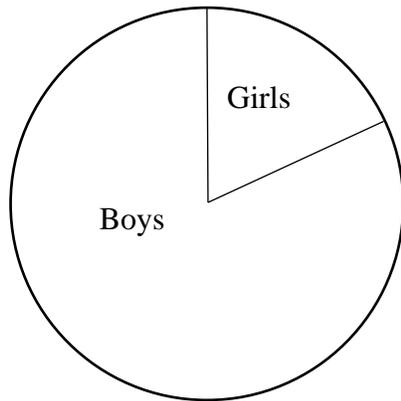

Students who scored Distinction in
Mathematics Common Test

7	I do not agree.	B1
	1) Although the number of girls who scored distinction may be lower than the number of boys, the percentage of passing may be higher.	B1 accept any valid reason
	2) There is no actual number of boys and girls given taking the test, hence it is not conclusive of the statement.	
	3) This data does not show the central tendency of distribution (mean, mode, median)	

Answer …………………………………………………………………………………………………

……

.... [2]

8   The diagram below shows the graph of $y=(x-h)^2+k$.
The graph cuts the *y*-axis at the point (0 , 9) and has a minimum point at (*h* , 5).
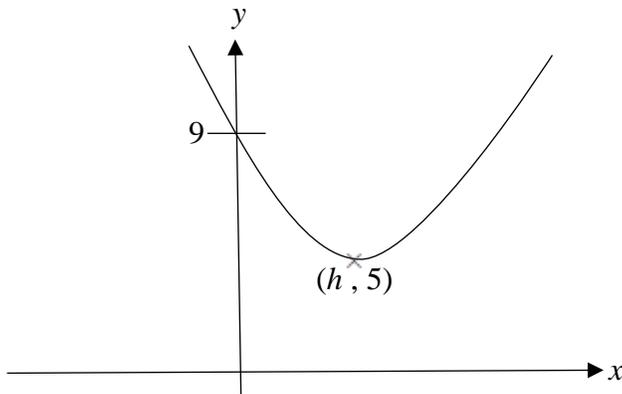
   (a)   State the value of *k*.

8(a)	$k = 5$	B1

Answer k = …………..……… [1]

Secondary Four Mathematics Preliminary Examination 2022

(b) Find the value of *h*.

8(b)	Using the point (0 , 9), $9 = (0 - h)^2 + 5$ $4 = h^2$ $\therefore h = \pm 2$ Since $h > 0$, $h = 2$	M1 A1. No marks awarded if students never state the condition of *h*.

Answer h = …………..……… [2]

(c) State the number of solutions when $y < 5$.

8(c)	0	B1

Answer …………..……..……... [1]

9 Factorise the following completely.

(a) $2a^2 - 6b^2 + ab$.

9(a)	$2a^2 - 6b^2 + ab = (a + 2b)(2a - 3b)$	B1

Answer …………………..………… [1]

(b) $2 - 8x^2 + 4x^2 y - y$.

9(b)	$2 - 8x^2 + 4x^2 y - y = 2(1 - 4x^2) + y(4x^2 - 1)$	M1: for grouping
	$= (2 - y)(1 - 4x^2)$	M1
	$= (2 - y)(1 - 2x)(1 + 2x)$	A1 o.e

Answer ………………………... [3]

10 Express as a single fraction in the simplest form $\dfrac{2x}{(2x-1)^2} - \dfrac{2}{2x-1}$.

10	$\dfrac{2x}{(2x-1)^2} - \dfrac{2}{2x-1} = \dfrac{2x - 2(2x-1)}{(2x-1)^2}$ $= \dfrac{-2x+2}{(2x-1)^2}$ $= \dfrac{2(1-x)}{(2x-1)^2}$	M1: for correct denominator A1 either answer accepted

Answer …..……………………... [2]

11 A fruit seller purchased 100 mangoes at $2 each. Four were spoilt. After selling all the remaining mangoes, his total profit was 20%. Calculate the selling price of each mango.

11	Profit $= 20\%$ of $200 $= \$40$ 96 mangoes are sold for $240 Each mango is sold for $\$240 \div 96 = \$2.50$	M1 obtaining $40 or $240 A1

Answer $.....……………….. [2]

12 (a) Given that T is directly proportional to $\sqrt{x}$, find the percentage increase in T when the value of x is increased by 8 times.

12(a)	$T = k\sqrt{x}$ When x was increased by 8 times, New $T = k\sqrt{9x}$ $= 3k\sqrt{x}$ Percentage increase in $T = \dfrac{3k\sqrt{x} - k\sqrt{x}}{k\sqrt{x}} \times 100\%$ $= 200\%$		M1 A1

Answer ...…………………. % [2]

(b) Jane can prepare 4 full cups of bubble tea in 3 minutes. Danny can prepare 9 full cups in 7 minutes. Find the total number of full cups prepared by them in 20 minutes.

12(b)	In 1 minute, Jane can prepare $\dfrac{4}{3}$ cups Danny can prepare $\dfrac{9}{7}$ cups In 20 minutes, Jane can prepare $\dfrac{80}{3}$ cups $= 26\dfrac{2}{3}$ cups Danny can prepare $\dfrac{180}{7}$ cups $= 25\dfrac{5}{7}$ cups Together they prepare $26 + 25 = 51$ cups or Together they prepare $26\dfrac{2}{3} + 25\dfrac{5}{7} = 52\dfrac{8}{21}$ ≈ 52	M1 M1 A1 Accept either answers

Answer …..……………….. [3]

Secondary Four Mathematics Preliminary Examination 2022

13 **(a)** Given

$\xi = \{ x : x \text{ is an integer and } 0 < x \le 14 \}$.

$A = \{ x : x \text{ is a factor of } 12 \}$.

$B = \{ x : x \text{ is an integer such that } 4x \ge 23 \}$.

(i) List the elements in $A' \cap B'$.

13(ai)	$A' \cap B' = \{5\}$	B1. Accept 5 if students never write the set.

Answer …..……………………….. [1]

(ii) Write down the number of elements in the set $A \cup B$.

13a(ii)	13	B1

Answer …..……………………….. [1]

14 A map has a scale of 1: 4 000 000. The length of a river running through a national park is 1.4 cm.

(a) Calculate the length of the river in km.

14a)	$1 : 4\,000\,000$ $1cm : \dfrac{4\,000\,000}{100\,000} km$ $1cm : 40km$ $Therefore\ 1.4cm : 1.4 \times 40km$ $\qquad\qquad\quad : 56km$	M1 correct conversion to km. A1

Answer …………………….km [2]

(b) The area of the park is 52 000 km². Calculate, the area of the park in the map.

14b)	$1cm : 40km$ $Area\ scale$ $(1cm)^2 : (40km)^2$ $1cm^2 : 1600km^2$ $Therefore\ 52\,000km^2 = \dfrac{52000}{1600}cm^2$ $\qquad\qquad\qquad = 32.5\,cm^2$	M1 A1

Answer …………….………… cm² [2]

15 *ABCD* is a parallelogram. $\overrightarrow{AB} = \begin{pmatrix} -1 \\ -5 \end{pmatrix}$ and $\overrightarrow{BD} = \begin{pmatrix} 4 \\ 8 \end{pmatrix}$. The coordinates of *D* is $(6, 2)$. Find

(a) the coordinates of *B*,

15a	$\overrightarrow{BO} + \overrightarrow{OD} = \overrightarrow{BD}$	
	$\overrightarrow{OB} = \overrightarrow{OD} - \overrightarrow{BD}$	
	$= \begin{pmatrix} 6 \\ 2 \end{pmatrix} - \begin{pmatrix} 4 \\ 8 \end{pmatrix}$	
	$= \begin{pmatrix} 2 \\ -6 \end{pmatrix}$	
	$\therefore B(2, -6)$	B1

Answer (…..……… , …………) [1]

(b) $\overrightarrow{BC}$,

15b	$\overrightarrow{BA} + \overrightarrow{BC} = \overrightarrow{BD}$	
	$\overrightarrow{BC} = \overrightarrow{BD} - \overrightarrow{BA}$	
	$= \begin{pmatrix} 4 \\ 8 \end{pmatrix} - \begin{pmatrix} 1 \\ 5 \end{pmatrix}$	
	$= \begin{pmatrix} 3 \\ 3 \end{pmatrix}$	B1

Answer $\overrightarrow{BC} = \begin{pmatrix} \\ \end{pmatrix}$ [1]

(c) the magnitude of $\overrightarrow{CD}$.

15c	$\left|\overrightarrow{CD}\right| = \left|\overrightarrow{AB}\right|$	
	$= \sqrt{(-1)^2 + (-5)^2}$	M1
	$= \sqrt{26}$	
	$= 5.09902$	
	$= 5.10$	A1

Answer …..……………………..units[1]

16 **(a)** Find the interior angle of a regular 18-sided polygon.

16a)	Each interior angle $=\dfrac{(18-2)}{18}\times180°$ $=160°$	B1

Answer …..………………….° [1]

(b) An *n*-sided polygon has 3 exterior angles measuring 70° each and the remaining exterior angles measuring $w°$ each. Find w in terms of *n*.

16b)	Sum of exterior of polygon is always $= 360°$ $3\times70° + (n-3)w = 360°$ $(n-3)w = 360° - 210°$ $w = \dfrac{150°}{n-3}$	M1 A1

Answer w = ……..……..……… [2]

17 **(a)** The thickness of Mary's hair is 0.036 mm. Express the thickness of the hair, in metres, in standard form.

| 17a)	$1\text{m} = 1000\,\text{mm}$ $1\text{mm} = \dfrac{1}{1000}\,\text{m}$ $1\text{mm} = 1\times10^{-3}\,\text{m}$ $0.036\text{mm} = 0.036\times10^{-3}$ $\qquad = 3.6\times10^{-5}$	B1

Answer …..……………………….m [1]

(b) After a hair bonding treatment, Mary's hair length is 4 cm longer than Betty. Given that the rate of their hair growth is 1.2 cm and 1.6 cm per month respectively, calculate the time taken, in months, for their hair to be of the same length.

17b)	Let t be the time taken $1.2t + 4 = 1.6t$ $0.4t = 4$ $t = 10\,\text{months}$	M1 A1

Answer …..………………months [2]

Secondary Four Mathematics Preliminary Examination 2022   **[Turn over]**

18 The sketch shows the graph of $y = ka^x + 1$ where $a > 0$.
The points $(0, -3)$ and $(4, -323)$ lie on the graph.
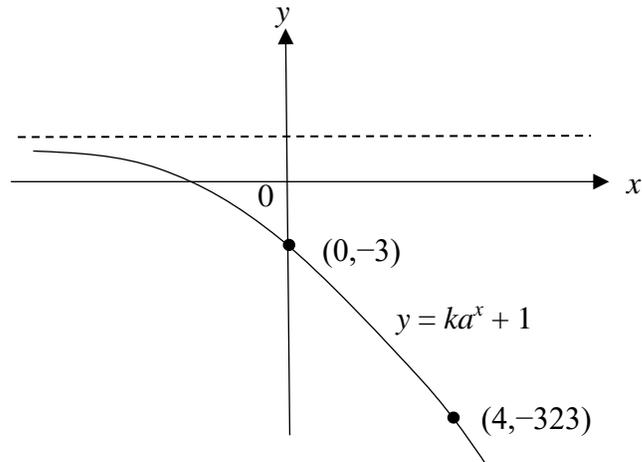
Find the value of
(a) k and

18(a)	Using the point $(0, -3)$, substitute into the equation of the curve, $-3 = ka^0 + 1$ $-4 = k$	B1

Answer k =…..………………….. [1]

(b) a.

18(b)	Using the point $(4, -323)$, substitute into the equation of the curve, $-323 = -4a^4 + 1$ $-324 = -4a^4$ $a^4 = 81$ $\therefore a = 3$ or -3 Since $a > 0$, hence, $a = 3$ (reject $a = -3$)	B1 Penalise from overall (under clarity) if students did not reject -3

Answer a =…..………………….. [2]

**Secondary Four Mathematics Preliminary Examination 2022**

19 In the diagram below, construct

(a) a perpendicular bisector of *AB*, [1]

(b) an angle bisector of angle *ABC*. [1]
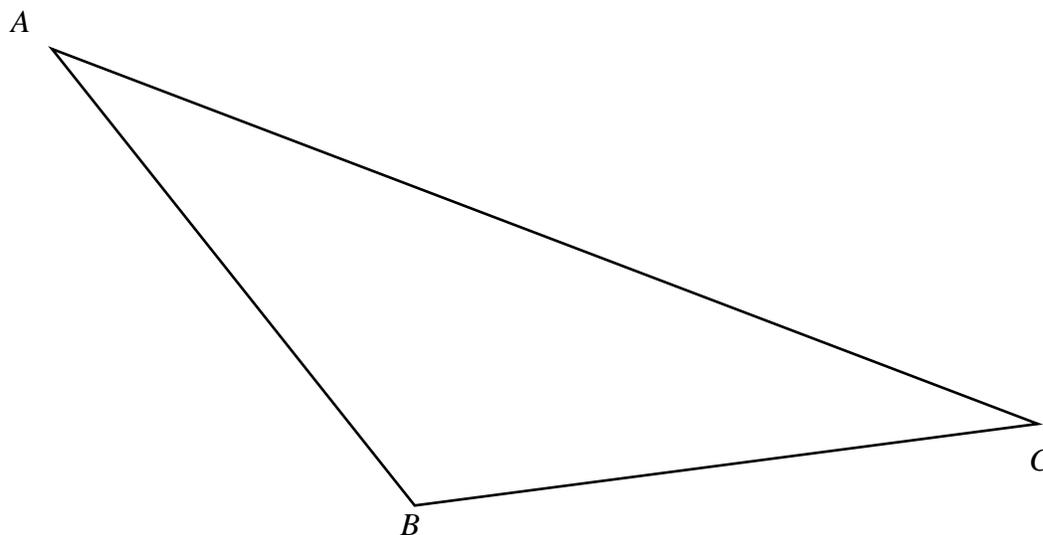
(c) These 2 lines from (a) and (b) meet at point *P*. Complete the sentence below.

Answer The point *P* is …………………..from point *A* and point *B*. It is also …………………

from the lines ………….. and ……………. . [2]

19a,b		
	Dist from P to C is 8.9 to 9.1 cm	
	1 mark for each construction	
19c	The point *P* is _equidistant_ from point *A* and point *B*. It is also _equidistant_ from lines _AB_ and _BC._	2 marks for all 4 answers. Accept 'same distance', 'same length'. Do not accept 'equal'

20 In the diagram, *PQRS* is a square and ∠*QXY* = 45°. Giving reasons clearly, prove that triangle *PXS* is congruent to triangle *RYS*.

| 20 | *PS = SR* (property of square: all sides are equal in length)
∠*SPX* = ∠*SRY* (property of square: all angles are equal)
Triangle *QXY* is an isosceles triangle, thus *QX = QY*.
Hence, *PX = RY*

By SAS test of congruency, triangle *PXS* is congruent to triangle *RYS*. | M1 for stating the property of square.

M1 for stating isosceles triangle.

A1. Do not award this mark if students never state the test.

No marks if students state the test as RHS. |

Answer …...………………………………….……………….………………………………

……………………………………………………………………….…………………………

…………………………………………………………………………………………….. [3]

21 Solve the equation $\dfrac{4m+7}{m^2+1}-\dfrac{5}{2m-1}=\dfrac{3}{m^2+1}$

$\dfrac{4m+7}{m^2+1}-\dfrac{5}{2m-1}=\dfrac{3}{m^2+1}$	
$\dfrac{4m+7}{m^2+1}-\dfrac{3}{m^2+1}=\dfrac{5}{2m-1}$	
$\dfrac{4m+4}{m^2+1}=\dfrac{5}{2m-1}$	M1 for forming the algebraic fraction
$(4m+4)(2m-1)=5(m^2+1)$	
$8m^2+4m-4=5m^2+5$	
$3m^2+4m-9=0$	M1 for forming the quadratic equation
$m=\dfrac{-4\pm\sqrt{4^2-4(3)(-9)}}{2(3)}$	M1 for using the formula or any method to solve x
$m=\dfrac{-4\pm\sqrt{124}}{6}$	
$m=1.1892 \text{ or } -2.5225$	
$m=1.19 \text{ or } -2.52 \quad (3s.f.)$	A1
or	
$\dfrac{4m+7}{m^2+1}-\dfrac{5}{2m-1}=\dfrac{3}{m^2+1}$	
$\dfrac{(4m+7)(2m-1)}{(m^2+1)(2m-1)}-\dfrac{5(m^2+1)}{(2m-1)(m^2+1)}=\dfrac{3}{m^2+1}$	M1 LCM approach on LHS (Do not expand denominator)
$\dfrac{8m^2-4m+14m-7-5m^2-5}{(m^2+1)(2m-1)}=\dfrac{3}{m^2+1}$	
$3m^2+10m-12=3(2m-1)$	
$3m^2+10m-12=6m-3$	M1 Simplify. Cross multiply. Cancel (m^2+1) on RHS. Obtain the quadratic equation.
$3m^2+4m-9=0$	
$m=\dfrac{-4\pm\sqrt{4^2-4(3)(-9)}}{2(3)}$	
$m=\dfrac{-4\pm\sqrt{124}}{6}$	M1 for using formula to solve m
$m=1.1892 \text{ or } -2.5225$	
$m=1.19 \text{ or } -2.52 \quad (3s.f.)$	A1

Answer m =………… or m =………….. [4]

22 Given that B = {black grapes}, G = {green grapes}, S = {sweet grapes} and
L = {seedless grapes}.
    (a)   Use set notation to express each of the following statements:
       (i)   all seedless grapes are sweet but not all sweet grapes are seedless,

(ai)	$L \subset S$. Accept $S \cap L = L$	B1

Answer …...……………………….. [1]

       (a)   no green grapes are seedless.

(aii)	$G \cap L = \varnothing$ or { }	B1.

*Answer* …...……………………….. [1]

    (b)   Write a statement to explain what does $(G \cup B) \cap S \neq \varnothing$ means.

(b)	<u>There are</u> black <u>or</u> green grapes that are sweet.	B1. 1st underlined, accept 'some', 'many', 'most' Do not accept 'All' (1st underlined), 'and' (2nd underlined)

Answer …………...................………………………………………………………………………

…………………………………………………………………………………………………….. [1]

23 The figure below is made up of 2 equilateral triangles *SPR* and *PQR*. *PQ* is $(x + 2y)$ cm,
QR is $(3x + y)$ cm and *PS* is $(2x + 4y - 3)$ cm.
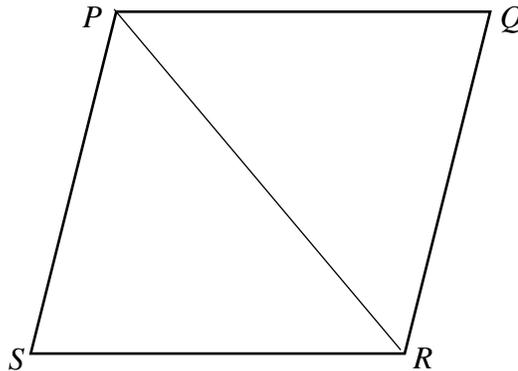
    (a)   Form, without simplifying, 2 simultaneous equations in terms of x and y.
   Answer

(a)	$x + 2y = 3x + y \ ------(1)$ $x + 2y = 2x + 4y - 3 ----(2)$ or $3x + y = 2x + 4y - 3 ----(2)$	B1

[1]

    (b)   Hence, find the value of x and of y.

Secondary Four Mathematics Preliminary Examination 2022

(b)	From (1), $y = 2x$ ------(3) Sub (3) to (2), $x + 2(2x) = 2x + 4(2x) - 3$ $\qquad 5x = 10x - 3$ $\qquad x = \dfrac{3}{5}$ or 0.6 Sub $x = \dfrac{3}{5}$ or 0.6 to (3) $\therefore y = \dfrac{6}{5}$ or 1.2 $x = 0.6$ or $y = 1.2$	M1 for using substitution method Accept use of elimination method A2 for finding both x and y.

Answer $x =$ ....
$y =$ …...……………………….. [3]

(c) **F**ind the area of the figure.

(c)	Length of square = 3 cm, Area of the figure = $\dfrac{1}{2} \times 3 \times 3 \times \sin 60° \times 2$ $\qquad = 7.79 cm^2$	M1 A1.

Answer …...……………….... cm² [2]

24 In the diagram, angle $EBC = 58°$, angle $BAE = 66°$ and angle $EDC = 132°$. The line BE bisects angle ABC.
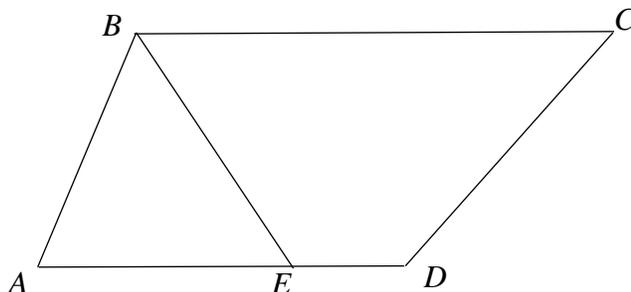
(a) State angle ABE.

(a)	Angle $ABE = 58°$	B1

Answer Angle $ABE =$ …..…………. ° [1]

(b) Giving reasons clearly, find
    (i) angle *AEB*,

(bi)	Angle $AEB = 180° - 58° - 66°$ (sum of angle in triangle *ABE*) $= 56°$	B1 Minus 1 from this qn if reasons not stated

Answer Angle *AEB* = ………….....…° [1]

    (ii) angle *DCB*.

(bii)	Angle $DCB = 360° - 116° - 66° - 132°$ (sum of angle in quadrilateral *ABCD*)
	          $= 46°$
	 or
	   Angle $DCB = 360° - 132° - 58° - (180° - 56°)$ (sum of angle in quadrilateral *BEDC*)
	          $= 46°$
		B1
		 As above

Answer Angle *DCB* = ………….……° [1]

(c) Show that *BC* is not parallel to *AD*.

| (c)	For two lines to be parallel, the sum of interior angles is 180°. Angle $ABC = 2 \times 58°$ Angle $BAE = 66°$ Since angle $ABC +$ angle $BAE = 182°$ and not 180°, $\therefore BC$ is not parallel to *AD*. or Since angle AEB is not equal to angle EBC, hence BC is not parallel to AD (converse of alternate angle) or For two lines to be parallel, the sum of interior angles is 180°. Angle $ADC = 132°$ Angle $BCD = 46°$ Since angle $ADC +$ angle $BCD = 178°$ and not 180°, $\therefore BC$ is not parallel to *AD*.	B1 when sum of angles $= 182°$ and $\neq 180°$ is sighted. or B1 or B1 when sum of angles $= 178°$ and $\neq 180°$ is sighted.

Answer …....……………………………………………………………………………

……………………………………………………………………………………………

.…………………………………………………………………………………………….. [1]

Secondary Four Mathematics Preliminary Examination 2022

25 A right solid cone is made up of frustrum A, frustrum B and cone C.
The ratio of the slant height of A, B and C is given by $L_A : L_B : L_C = 2:3:5$.
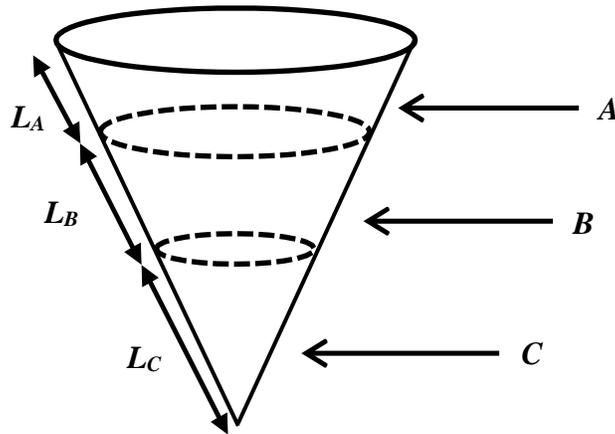
(a) Find the ratio of volume of A : volume of whole cone.

24(a)	Using similar figures, Volume of A : Volume of whole cone $(10^3 - 8^3)$: 10^3 $\quad$ 488 $\quad$: $\quad$ 1000 $\quad$ 61 $\quad$: $\quad$ 125	M1 for able to find the volume part of A A1

Answer …....……… : …………….. [2]

(b) Given that the volume of A is 122 cm^3, calculate the volume of B.

(b)	By similar figures, Volume of A : Volume of B $\quad$ 488 $\quad$: $\quad$ $(8^3 - 5^3)$ $\quad$ 488 $\quad$: $\quad$ 387 By proportion, Volume of $B = \dfrac{387}{488} \times 122$ $\quad = 96.75$ cm^3 (exact) Or Volume of whole cone $= \dfrac{125}{61} \times 122$ $\quad = 250$ cm^3 Volume of cone $C = \left(\dfrac{5}{10}\right)^3 \times 250$ $\quad = 31.25$ cm^3 Volume of $B = 250 - 122 - 31.25$ cm^3 $\quad = 96.75$ cm^3	M1 for finding the volume part of B A1. Students can leave in improper or mixed number. If students correct to 3s.f, no marks awarded. M1 for finding both whole cone and cone C. A1. As above

Answer …….…….………… cm^3 [2]

End of Paper