BEATTY SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2024
SECONDARY ONE G3

CANDIDATE NAME	

CLASS		REGISTER NUMBER	

MATHEMATICS

2 October 2024
2 hours

Candidates answer on the Question Paper
Additional Materials: NIL

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number 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** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.

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 total of the marks for this paper is 80.

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.

For Examiner's Use

1 **(a)** Write the following numbers in order of size, starting with the **smallest**.

$$0.85, \quad \sqrt{0.85}, \quad 0.85\%, \quad \left(\frac{4}{5}\right)^2$$

Answer …………, ……..……….., …………., ………… [1]

(b) Calculate $\dfrac{12.56}{23.9 - 4.87^2}$. Leave your answer correct to 2 significant figures.

Answer …………………....……. [1]

2 Factorise completely each of the following expressions.

(a) $15xy - 27yz$,

Answer …………………....……. [1]

(b) $-4a - 32ab - 12ac$,

Answer …………………....……. [1]

(c) $2x(a - 4b) - y(a - 4b)$.

Answer …………………....……. [1]

3 **(a)** Express 1960 as a product of its prime factors in index notation.

Answer 1960 = ………………....……. [1]

(b) Written as a product of its prime factors, $2646 = 2 \times 3^3 \times 7^2$.

(i) Write down the HCF of 1960 and 2646.

Answer …..…………………....…… [1]

(ii) Write down the smallest integers p and q such that $\dfrac{2646p}{q}$ is a perfect cube.

Answer p =………………….....……. [1]

q =…..………………....……. [1]

4   Wong bought a bag for $95.95 and two shirts which costs $39.80 each.

   (a)   By rounding off each number to 1 significant figure, estimate Wong's spending altogether.

Answer $.……………………… [2]

   (b)   Without doing further calculation, explain why Wong's actual spending is lesser or more than the estimated spending.

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

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

   ………………………………………………………………………. [1]

5   **(a)**   Expand and simplify $2(x + 2y) - 3(2x - y)$.

Answer ………………...……… [2]

(b) Express $\dfrac{3x-2}{5} + \dfrac{4x+7}{3}$ as a single fraction in its simplest form.
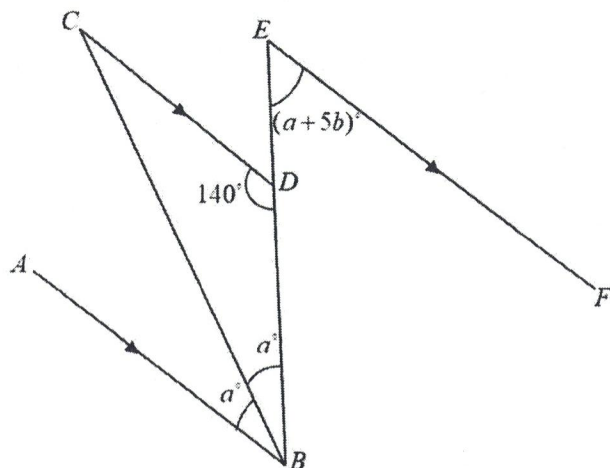
Answer .... [3]

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6 (a) Alex, Ben and Claire shared a sum of money between them in the ratio of 5 : 3 : 8.
Ben has $186 less than Alex.
Find the total amount of money they have altogether.

Answer ....…....... [2]

(b) Pete bought 2 watermelons at $m each and a bag of grapes for $12. He paid with a 50 dollar note and received y cents in return.
Find an expression for m in terms of y.

Answer $ ....…........ [2]

7 In the diagram, *AB*, *CD* and *EF* are parallel to each other. Angle *ABC* = angle *CBD* = $a°$, angle *CDB* = 140° and angle *DEF* = $(a+5b)°$.

Find, stating the reasons,

(a) reflex angle *CDB*,

Answer ……………………… [1]

(b) the value of *a* and of *b*.

Answer *a* = …………………, *b* = ……………….. [4]

8 (a) Complete the table of values for $y = 3x - 2$.

x	-2	-1	0	1	2
y	-8		-2	1	4

[1]
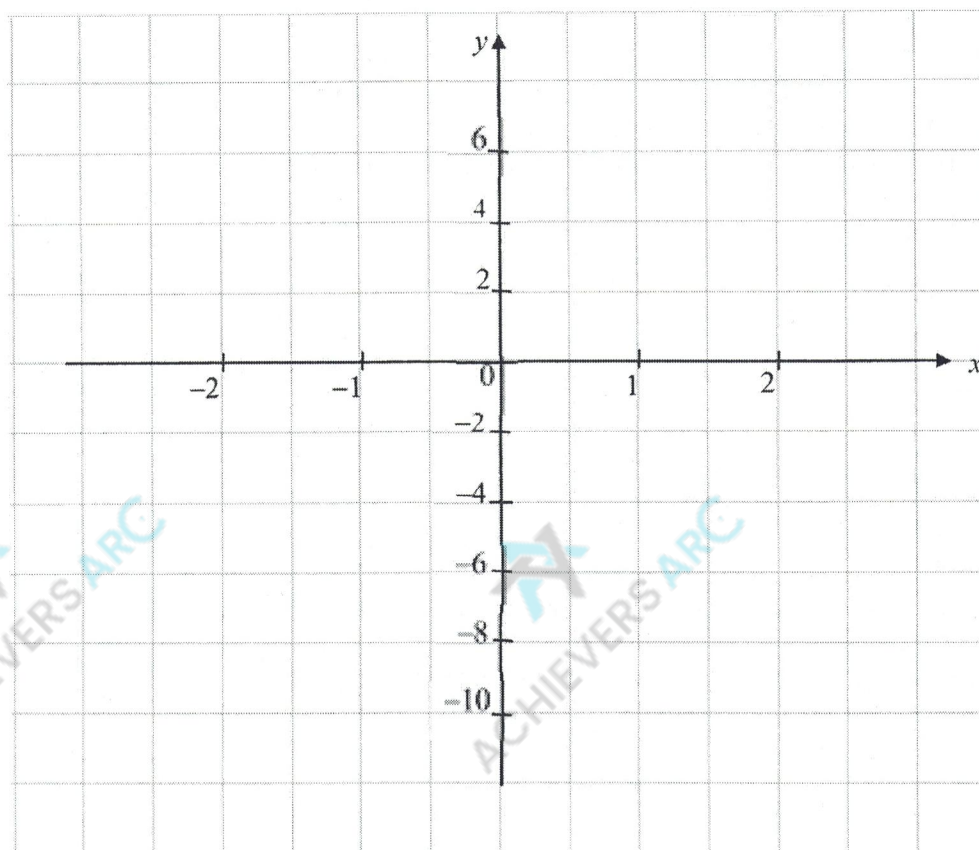
(b) On the grid, draw the graph of $y = 3x - 2$ for $-2 \le x \le 2$. [2]

(c) Using your graph, find the value of x when $y = -6$.

Answer $x =$ ……………………… [1]

(d) On the same grid, draw the graph of $y = 2$. [1]

[Turn over

9 Tang drove 240 km from Singapore to Malacca at 85 km/h.

(a) Express 85 km/h in m/s.

Answer ………………..... m/s [1]

(b) Find the time taken by Tang to reach Malacca.
Leave your answer in hours and minutes, to the nearest minutes.

Answer ……… hours ………..minutes [2]

(c) Tang then drove to Kuala Lumpur at 92 km/h and he arrived at his destination in
1 hour 35 minutes.
Find his average speed for the journey from Singapore to Kuala Lumpur.

Answer ……………….. km/h [3]

(d) The petrol consumption for his car is 8 litres per 100 km.
Find the petrol consumption for his journey from Singapore to Kuala Lumpur.

Answer ……………….. litres [1]

10 In a sequence, the same number is subtracted each time to obtain the next term.
The first five terms of the sequence are

$$27, \quad p, \quad q, \quad r, \quad 3.$$

(a) Find the values of p, q and r.

Answer p = ... [1]

q = ... [1]

r = ... [1]

(b) Write down an expression, in terms of n, for the nth term.

Answer .... [1]

(c) Is -107 a term of this sequence?
Show your working and give a reason to support your answer.

Answer ....

.... [2]

11 (a) Construct a quadrilateral *PQRS* such that *QR* = 10 cm, *RS* = 11 cm, *PS* = 7 cm and
∠*PQR* = 100˚. The side *PQ* has been drawn for you.
All construction arcs and lines must be clearly shown.

Answer

[3]

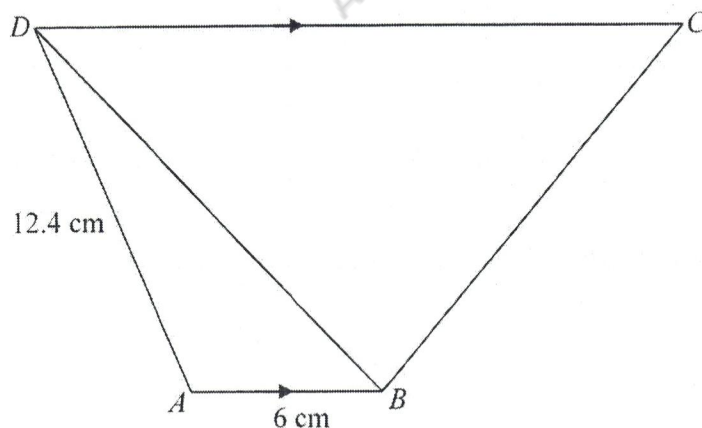*P* ————————————————————————— *Q*

(b) Write down the size of angle *PSR*.

Answer ……………………… [1]

12 In the diagram, $ABCD$ is a trapezium where AB is parallel to DC.
$AB = 6\,\text{cm}$, $AD = 12.4\,\text{cm}$ and the perimeter of the trapezium $ABCD$ is 53.4 cm.

(a) Given that $BC : CD = 3 : 4$, show that the length of CD is 20 cm.

Answer   [2]

(b) The area of trapezium $ABCD$ is 150.8 cm². Find the area of the triangle ABD.

Answer .... cm² [4]

[Turn over

13   A shop is selling chocolate cookies on two different offers.

	Offer *A*	Offer *B*
Original Price	200 g costs $4.80	360 g costs $6
Promotion	25% extra free	10% off the price

Showing **your working clearly**, explain which offer is better value for money.

Answer

Offer .... is better value for money.   [4]

14 The diagram shows an equilateral triangle *BCD* and the three sides, *AB, BD* and *DE* of a regular polygon. The interior angle of the polygon is 100° more than its exterior angle.
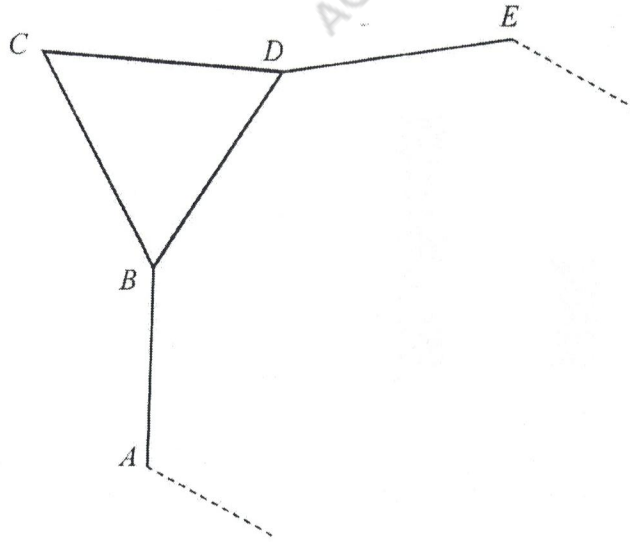
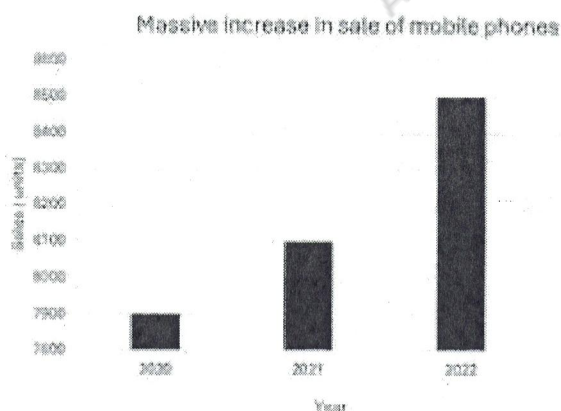

(a) Find the number of sides of the polygon.

Answer .... [3]

(b) Jane claimed that angle *CDE* is the interior angle of another regular polygon. Do you agree with Jane? Justify your decision.

Answer

[3]

15 **(a)** The diagram shows the sales of mobile phone in a company at the end of the given year.

Massive increase in sale of mobile phones

(i) State one misleading feature of the graph.

Answer ....

.... [1]

(ii) Explain how this feature affects the reader's interpretation of the graph.

Answer ....

.... [1]

(b) The time, in minutes, taken by 20 students to complete their homework on a particular day is shown below.

15	40	20	55	60	25	18	28	25	33
58	35	14	38	28	40	50	33	46	27

(i) Complete the frequency table below.

Answer

Time (x minutes)	Tally	Frequency
$0 < x \le 15$		
$15 < x \le 30$		
$30 < x \le 45$		
$45 < x \le 60$		

[2]

(ii) The data is represented on a pie chart. Calculate the angle of the sector which represents the data $30 < x \le 45$.

Answer .... [1]

16 Solve the following equations.

(a) $2(x-4)+5 = 4x+7$

Answer $x = $ .... [2]

(b) $\dfrac{8}{2x+5} = \dfrac{5}{1-3x}$

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

17 Tony ordered a new wooden nameplate for his office desk as shown in the diagram below. The nameplate is made of an isosceles triangular prism attached to a 1.5 cm high rectangular prism base. $AB = BC = 5$ cm, $ED = 6$ cm, $EF = 25$ cm and the perpendicular height of the triangle ABC is 4 cm.
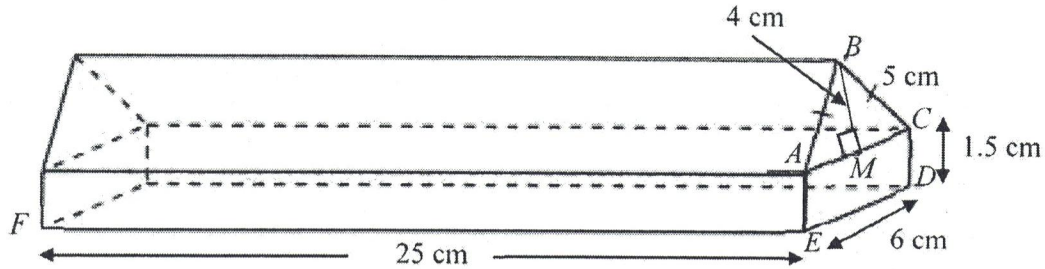
(a) Find the volume of the wooden nameplate.

Answer .... cm³ [3]

(b) Find the total surface area of the wooden name plate.

Answer .... cm² [3]