EDUCATION-NEWS CONSULT

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JUNE, 2023 MOCK EXAMINATION

MATHEMATICS FINAL MARKING SCHEME

PAPER 1

OBJECTIVE TEST

[40 MARKS]

1. D	6. C	11. D	16. A	21. B	26. B	31. B	36. D
2. D	7. D	12. D	17. C	22. B	27. B	32. C	37. D
3. B	8. C	13. A	18. B	23. A	28. B	33. D	38. B
4. B	9. C	14. C	19. B	24. C	29. C	34. C	39. B
5. A	10. D	15. C	20. C	25. D	30. C	35. B	40. B

PAPER 2

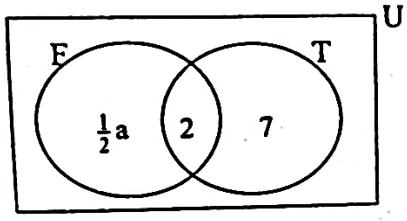
[60 MARKS]

QUESTION 1

(a) let μ = {students in the sporting club} = n(μ) = a

F = {students who play football}

T = {student who play table tennis}



B3 - $\frac{1}{2}ee$

$= \frac{1}{2}a + 2 + 7 = a$ **M1 for solving**

$= \frac{1}{2}a - a = -9$ **M1 for grouping like terms**

$= -\frac{1}{2}a = -9$

$= a = 18$ **A1 for 18**

Number of students in the class = 18

(b) **Find Q if $3Q = 16^2 - 13^2$**

$= 3Q = 16^2 - 13^2$

$= 3Q = (16 + 13)(16 - 13)$ **M1 for expanding**

$= 3Q = 29 \times 3$ **M1 for simplifying**

$= Q = \frac{29 \times 3}{3}$ **M1 for solving**

$= Q = 29$ **A1 for 29**

(c)

(i) <u>Find the number of sides of the polygon.</u>

$180(n - 2) = 900$

$= 180n - 360 = 900$ **M1 for expanding**

$= 180n = 900 + 360$ **M1 for grouping**

$= 180n = 1260$ **M1 for solving**

$= n = 7$ **A1 for 7**

(ii) **<u>What is the name of the polygon?</u>**

- Heptagon **A1 for Heptagon**

TOTAL = 15 MARKS

QUESTION 2

(a) A number is chosen at random from the integers 10 to 30 inclusive.

(i) Write down the set of outcomes.

- $\{10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30\}=21$ **B1**

(ii) **Find the probability that the number is a multiple of 3.**

- $n\{multiple\ of\ 3) = \{12,15,18,21,24,27,30\} = 7$ **B1**

  $p\{multiple\ of\ 3) = \frac{7}{21} = \frac{1}{3}$ **A1**

(iii) Find the probability that the number is a perfect square.

- $n\{perfect\ square) = \{16, 25\} = 2$ **B1**

  $n\{perfect\ square) = \frac{2}{21}$ **A1**

(b)

$= \frac{2x+6}{x^2-9}$

By factorization

$= \frac{2(x+3)}{(x+3)(x-3)}$ **M2 for factorization**

$= \frac{2}{x-3}$ **A2 for $\frac{2}{x-3}$**

To find $x\ when\ x = 4$

$= \frac{2}{4-3}$ **M1 for substitution**

$= \frac{2}{1} = 2$ **A1 for 2**

(c) Commission rate 5%, commission gained = GHC2500.00

Total sales $\frac{100}{5} \times$ GHC2500 **B1**

$100\times$ GHC 500 **M1 for solving**

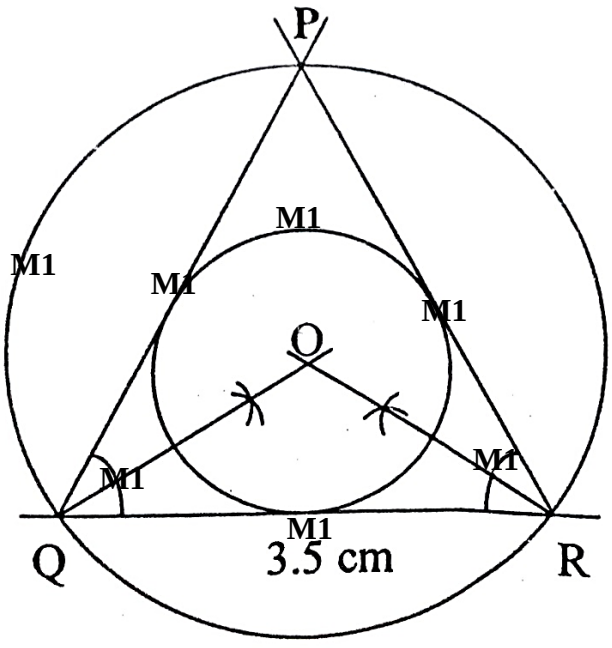
$=$ GHC50,000.00 **A2 for GHC50,000.00**

The total sales made for the month was GHC50,000,00

TOTAL = 15 MARKS

QUESTION 3

(a)



iii. Circle of radius = 1.7cm ± 1 **B 1.5**

iv. Circle of radius $OP = 4.3\text{cm} \pm 1$ **B 1.5**

(b) Solve $1 - 2q = 2 + \frac{q}{3}$

Multiplying through by the LCM

$= 3(1 - 2q) = 2 \times 3 + q$ **M1 for finding LCM**

$= 3 - 6q = 6 + q$ **M1 for solving**

Grouping like terms

$= -6q - q = 6 - 3$ **M1 for grouping like terms**

$= -7q = 3$ **M1 for simplifying**

$= q = \frac{3}{-7} = -\frac{3}{7}$ **A1 for $\frac{3}{-7}$ or $-\frac{3}{7}$**

TOTAL = 15 MARKS

QUESTION 4

(a) (i)

Weekday	**Probability of favorite meal**	**Probability of not eating favorites meal**
Monday	0.2	**0.8**
Tuesday	**0.7**	0.3
Wednesday	**1**	0
Thursday	0.6	**0.4**
Friday	**0.1**	0.9

B5 - $\frac{1}{2}$ee

(ii) **From 4(a)(i) above, on which day is Joel likely to eat his favourite meal?**

- Wednesday **A1**

(iii) **On which day is Joel most likely not to eat his favourite meal?**

- Friday **A1**

(b) The mean of the numbers 2, 3, $(x + 1)$, and 5 is 3. Find the value of x.

$\bar{x} = \frac{\sum x}{n}$ where $n = 4$ and $\bar{x} = 3$

By substituting

$= \bar{x} = \frac{2+3+(x+1)+5}{4}$ but $\bar{x} = 3$ **M 1 for substituting**

$= 3 = \frac{2+3+(x+1)+5}{4}$

$= 12 = 10 + (x + 1)$ **M 1 simplifying**

Grouping like terms

$= 12 - 10 = x + 1$ **M1 for grouping like terms**

$= 2 = x + 1$

$= x = 1$ **A1 for 1**

(c)

$\frac{3Z-2}{5} = \frac{1-4Z}{10} + 5.$

Multiplying through by 10 (LCM)

$10 \times (\frac{3Z-2}{5}) = 10(\frac{1-4Z}{10}) + 10(5).$ **M 1 for substituting**

$2(3Z - 2) = 1 - 4Z + 50$ **M 1 simplifying**

$6Z - 4 = 1 - 4Z + 50$

$6Z + 4Z = 1 + 50 + 4$ **M 1 for grouping**

$10Z = 55$

$Z = \frac{55}{10} = 5.5$ **M 1 A1for solving**

TOTAL = 15 MARKS

QUESTION 5

(a) (i) **Make n the subject of the relation.**

$\mathrm{A} = 180 - \frac{360°}{n}$

$= \mathrm{An} = 180\mathrm{n} - 360°$ **M1 for solving**

$= 360 = 180n - An$ **M1 for simplifying**

$= 360 = n(180 - A)$

$\mathrm{n} = \frac{360}{180-\mathrm{A}}$ **A1 for $\frac{360}{180-\mathrm{A}}$**

(ii) **Find A if $n = 20$;**

$\mathrm{A} = 180 - \frac{360°}{n}$

$\mathrm{A} = 180 - \frac{360°}{20}$ **M1 for substituting**

$= \mathrm{A} = 162°$ **A1 for $162°$**

(iii) **Find n if $\mathrm{A} = 165.6°$.**

$n = \frac{360}{180-165.6}$ **M1 for substituting**

$= \frac{360}{14.4}$ **M1 for simplifying**

$= 25$ **A1 for 25**

(b) (i) **Bad;**

$\mathrm{S} = \{12)$

$= \mathrm{P(B)} = \frac{8}{12} = \frac{2}{3}$ **M0.5A1**

(ii) **Good.**

$12 - 8 = 4$

$\mathrm{P(G)} = 4$

$= \mathrm{P(G)} = \frac{4}{12} = \frac{1}{3}$ **M0.5A1**

(c) **Find the value of x in the diagram below**

Opposite interoir angle = exterior angle

$= 2x + 7 + x + 17 = 9x$ **M1 for equating**

$= 3x + 24 = 9x$ **M1 for simplifying**

$= 24 = 9x - 3x$ **M1 for grouping like terms**

$24 = 6x$

$x = 4$ **A1 for 4**

TOTAL = 15 MARKS

QUESTION 6

(a) let each equal angle be x

$120 + 180° + 4x = 720°$ **M0.5 for equating**

$4x = 720° - 300°$ **M0.5 for simplifying**

$4x = 420°$

$x = 105°$ **A1 for $105°$**

Each equal angle is $105°$

(b)

(i) **Prepare a frequency table for the above data.**

Marks (x)	**Frequency (f)**	fx
1	2	2
2	3	6
3	2	6
4	1	4
5	4	20
6	10	60
7	5	35
8	4	32
9	3	27
10	1	10
	$\sum f = 35$	$\sum fx = 202$

B3 - $\frac{1}{2}ee$

(ii) **Find the modal mark.**

- The modal mark is 6. **M1**

  (Because it is the mark with the height frequency of 10)

(iii) **Calculate the mean mark.**

Mean $= \frac{\sum fx}{\sum f} = \frac{202}{35} = 5.77$ **M1A1**

(iv) **Mark obtained is less than 5**

$= \frac{2+3+2+1}{35}$ **M0.5**

$= \frac{8}{35}$ **A1**

(v) **What percentage of the class failed if the pass mark is 6?**

$= 4 + 1 + 2 + 3 + 2 = 12$ **M0.5**

$= \frac{12}{35} \times 100\%$ **M1**

$= \frac{1200}{35}\%$

$= 34.28\%$ **A1**

(c)

$y - y_1 = m(x - x_1)$

$= (x_1, y_1) = (7, 2)$

$m = 2$

Equation of the line

$y - 2 = 2(x - 7)$ **M1**

$y - 2 = 2x - 14$

$y = 2x - 14 + 2$ **M1**

$y = 2x - 12$ **A1**

TOTAL = 15 MARKS