

GB ASSESSMENT TEST

VIRTUAL MOCK EXAMINATION (3) MATHEMATICS- APRIL, 2020 MOCK EXAMINATION- MARKING SCHEME

OBJECTIVE TEST

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

THEORY

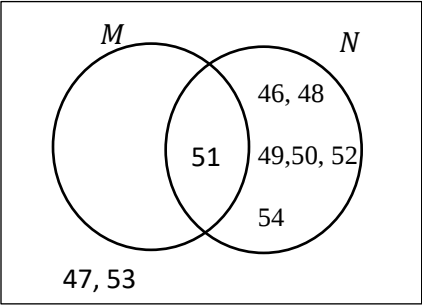
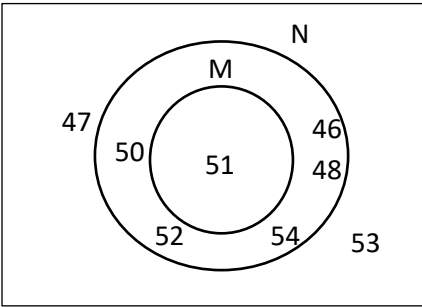
Q NO	SOLUTION																					
1	(a) i. $1680+ 1440 +1280+ 1000 + x+ y = 7200$ $5400+ x + y = 7200 \quad \text{M1}$ $x + y = 7200- 5400$ $x + y = 1800$ since the secretary’s salary is twice that of the Accountant $y = 2x$ $\therefore \quad 2x + x = 1800 \quad \text{M1}$ $3x = 1800$ $\frac{3x}{3} = \frac{1800}{3}$ $x = 600 \quad \text{A1}$ $\therefore$ the salary of the accountant is €600 $y = 2 \times 600$ $y = 1200$ $\therefore$ the salary of the secretary is €1,200 A1 ii. $\frac{600}{7200} \times 100\%$ $= \frac{1}{12} \times 100 \quad \text{M1}$ $= \frac{100}{12} \text{ or } 8.33\% \quad \text{A1}$ (b) <table><tr><th>Worker</th><th>Amount of salary</th><th>Angle of sector</th></tr><tr><td>General Manager</td><td>1680</td><td>$\frac{1680}{7200} \times 360^0 = 84^0$</td></tr><tr><td>Chief Consultant</td><td>1440</td><td>$\frac{1440}{7200} \times 360^0 = 72^0$</td></tr><tr><td>Assessment supervisor</td><td>1280</td><td>$\frac{1280}{7200} \times 360^0 = 64^0$</td></tr><tr><td>Accountant</td><td>1200</td><td>$\frac{1200}{7200} \times 360^0 = 30^0$</td></tr><tr><td>Marketing consultant (M.C)</td><td>1000</td><td>$\frac{1000}{7200} \times 360^0 = 50^0$</td></tr><tr><td>Secretary</td><td>600</td><td>$\frac{600}{7200} \times 360^0 = 30^0$</td></tr></table>	Worker	Amount of salary	Angle of sector	General Manager	1680	$\frac{1680}{7200} \times 360^0 = 84^0$	Chief Consultant	1440	$\frac{1440}{7200} \times 360^0 = 72^0$	Assessment supervisor	1280	$\frac{1280}{7200} \times 360^0 = 64^0$	Accountant	1200	$\frac{1200}{7200} \times 360^0 = 30^0$	Marketing consultant (M.C)	1000	$\frac{1000}{7200} \times 360^0 = 50^0$	Secretary	600	$\frac{600}{7200} \times 360^0 = 30^0$
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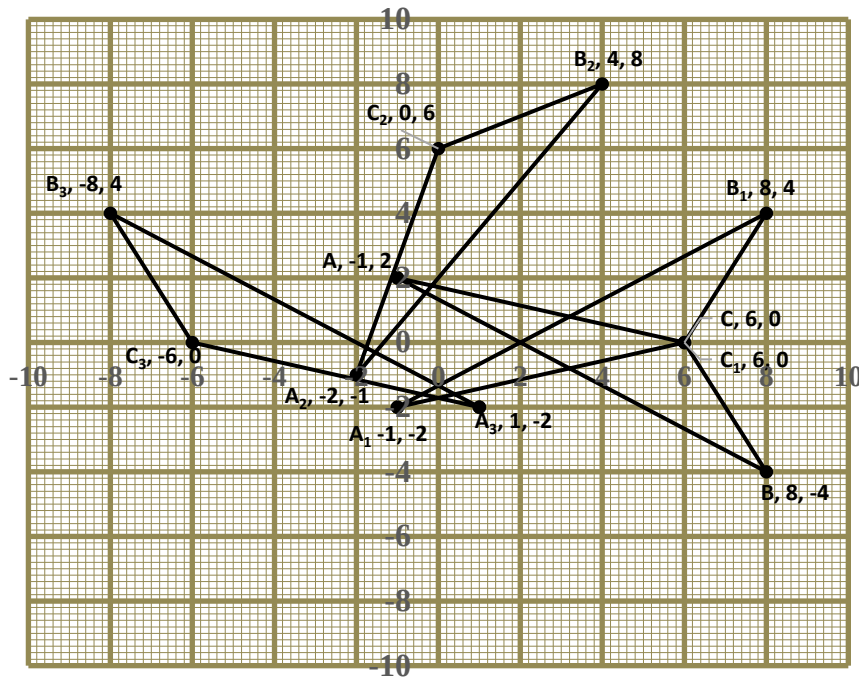
B3

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	(c)$\overrightarrow{EF}=\begin{pmatrix} -7 \\ 8 \end{pmatrix}$ and $\overrightarrow{UF}=\begin{pmatrix} -3 \\ -2 \end{pmatrix}$ $\overrightarrow{EU}=\overrightarrow{EF}+\overrightarrow{FU}$ M1 $\overrightarrow{FU}=-\overrightarrow{UF}=\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ $\overrightarrow{EU}=\begin{pmatrix} -7 \\ 8 \end{pmatrix}+\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ M1 $=\begin{pmatrix} -7+3 \\ 8+2 \end{pmatrix}$ $=\begin{pmatrix} -4 \\ 10 \end{pmatrix}$ A1												
2	(a) – Constructing $QR = 7\text{cm} \pm 0.1\text{ cm}$ B0.5 - Arcs for 90° at Q M0.5 - Arcs for 45° at Q												

	- Drawing line through arcs for 45° at Q - Drawing arc for PR = 6cm - Completing $\triangle PQR$	A0.5 B0.5 A1
	- Constructing arcs for locus l_1 - Drawing locus l_2 - Constructing arcs for locus l_2 - Drawing locus l_2 - Locating point T - Using centre T to draw circle	M0.5 M0.5 M0.5 A0.5 B0.5 B0.5
	(b) i. $\frac{3v+2u}{5} + \frac{u-5v}{8} - \frac{3v}{4}$ $\frac{8(3v+2u)+5(u-5v)-10(3v)}{40}$ M0.5 $\frac{24v+16u+5u-25v-30v}{40}$ M0.5 $\frac{24v-25v-30v+16u+5u}{40}$ $= \frac{-31v+21u}{40}$ A1 ii. $(n+5)(n-5) - 1(-n-25)$ $n(n-5) + 5(n-5) - 1(-n-25)$ M0.5 $n^2 - 5n + 5n - 25 - 1(-n-25)$ M0.5 $n^2 - 25 + n + 25$ $n^2 + n$ A1	
	(c) total number of marbles in the sack = $4+6+3+x = 13 + x$ Probability of picking a red marble = $\frac{4}{13+x} = \frac{2}{9}$ Cross multiplying $36 = 2(13 + x)$ M0.5 $36 = 26 + 2x$ $36 - 26 = 2x$ $10 = 2x$ $5 = x$ A1 Number of white marbles = 5 Total number of marbles = 18 ii. probability of picking a blue marble = $\frac{3}{18}$ Probability of picking a white marble = $\frac{5}{18}$ Add the two probabilities = $\frac{3}{18} + \frac{5}{18} = \frac{4}{9}$ Probability of not picking a blue or white marble = $1 - \frac{4}{9} = \frac{5}{9}$	M0.5 M0.5
3	(a) i. Perimeter of square of side 5 cm = 4L $= 4 \times 5\text{cm}$ $= 20\text{cm}$ Perimeter of square of side 7cm = 4L $= 4 \times 7\text{cm}$ $= 28\text{ cm}$ Ratio = 20: 28 $5: 7$ ii. Area of square of side 5 cm = 5cm x 5cm	M0.5 M0.5 M0.5 M0.5 A1 M0.5

	$= 25 \text{ cm}^2$ Area of square of side 7cm = 7cm x 7cm $= 49 \text{ cm}^2$ Ratio = 25: 49 (b) Let y be the number she started with $\frac{y-18}{6} = \frac{y-6}{18}$ $18(\frac{y-18}{6}) = 18(\frac{y-6}{18})$ $3(y-18) = y-6$ $3y-54 = y-6$ $3y-y = 54-6$ $2y = 48$ $\therefore$ Princess started with 24 (c) Let x = the exterior angle and 5x = the interior angle Interior angle + exterior angle = 180^0 $5x + x = 180^0$ $6x = 180^0$ $x = 30^0$ i. Interior angle = 5x $= 5 \times 30$ $= 150^0$ ii. Exterior angle = x $= 30^0$ iii. Exterior angle = $\frac{360^0}{\text{number of sides (n)}}$ $30^0 = \frac{360^0}{n}$ $30n = 360$ $n = 12$ $\therefore$ the polygon has 12 sides iv. Dodecagon (d) $36^{4a+3} = \frac{1}{216}$ $6^{2(4a+3)} = 6^{-3}$ $2(4a+3) = -3$ $8a+6 = -3$ $8a = -3-6$ $a = \frac{-9}{8}$	A0.5 M0.5 A0.5 A1 M1 M0.5 M0.5 A1 M0.5 A0.5 M0.5 A0.5 M0.5 A0.5 A1 M0.5 M0.5 A1
4	(a) i. $\mu = \{46, 47, 48, 49, 50, 51, 52, 53, 54\}$ $M = \{46, 48, 49, 50, 51, 52, 54\}$ $N = \{51\}$ $M^1 = \{47, 53\}$ $N^1 = \{46, 47, 48, 49, 50, 52, 53, 54\}$ ii. $\alpha. M \cap N = \{51\}$ $\beta. (A \cup B)^1 = \{47, 53\}$	B0.5 B0.5 B0.5 B0.5 B0.5 B1 B1

	iii.  μ Or μ  M1.5 (b) i. new rent for a month = $\frac{\text{GH}\text{\textcent}5,400.00}{3} = \text{GH}\text{\textcent}1,800.00$ M0.5 30% = GH\text{\textcent}1,800.00 40% = ? $\frac{40\%}{30\%} \times \text{GH}\text{\textcent}1,800.00$ A0.5 = GH\text{\textcent}2400.00 ii. 30 = GH\text{\textcent}1,800.00 M0.5 100 = ? $\frac{100}{30} \times \text{GH}\text{\textcent}1,800.00$ = GH\text{\textcent}6,000.00 A0.5 (c) $(\sqrt{\frac{9}{25}} + \frac{2}{3}) \times \frac{3}{4} \div \frac{1}{4}$ = $(\frac{3}{5} + \frac{2}{3}) \times \frac{3}{4} \times \frac{4}{1}$ M0.5 = $\frac{9+10}{15} \times 3$ M0.5 = $\frac{19}{15} \times 3$ = $\frac{57}{15}$ or $3\frac{12}{15}$ A1 (d) the perimeter of the quadrant = $2r + \text{length of the minor arc}$ B1 Length of the minor arc = $\frac{1}{4} \times 2\pi r$ B0.5 = $\frac{1}{4} \times 2 \times \frac{22}{7} \times 9$ M0.5 = $\frac{1}{2} \times \frac{22}{7} \times 9$ = $\frac{22}{14} \times 9$ = $\frac{198}{14} = 14.14\text{cm}$ A1 Perimeter of the quadrant = $(2 \times 9) + 14.14\text{cm}$ M1 = $18\text{cm} + 14.14\text{cm}$ = 32.14cm A1
5	(a) Axes correctly labeled (both) B1 - Correct scale and intervals B1 (b) i. Drawing triangle ABC B2 ii. Drawing triangle $A_1B_1C_1$ correctly B2 iii. Drawing triangle $A_2B_2C_2$ B2 iv. Drawing triangle $A_3B_3C_3$ B2



(b) i. A (-1, 2), B (8, -4) and C (6, 0)

ii. Reflection in the x-axis

$$\begin{pmatrix} x \\ y \end{pmatrix} \rightarrow \begin{pmatrix} x \\ -y \end{pmatrix}$$

A₁ (-1, -2)

B₁ (8, 4)

C₁ (6, 0)

iii. Anti-clockwise rotation through 90°

$$\begin{pmatrix} x \\ y \end{pmatrix} \rightarrow \begin{pmatrix} -y \\ x \end{pmatrix}$$

A₂ (-2, -1)

B₂ (4, 8)

C₂ (0, 6)

iv. Enlargement under the scale factor -1

$$\begin{pmatrix} x \\ y \end{pmatrix} \rightarrow -1 \begin{pmatrix} x \\ y \end{pmatrix} \rightarrow \begin{pmatrix} -x \\ -y \end{pmatrix}$$

A₃ = (1, -2)

B₃ = (-8, 4)

C₃ = (-6, 0)

(c) i. represent the first multiple with r

the second consecutive multiple = r + 9

$$r + (r + 9) = 63$$

M0.5

$$2r + 9 = 63$$

M0.5

$$2r = 63 - 9$$

M0.5

$$2r = 54$$

$$r = 27$$

M0.5

the second consecutive multiple is 27 + 9 = 36

the 2 consecutive multiples of 9 with the sum of 63 are 27 and 36

A1

ii. $4.8 \times 5.7 = 27.36$

M0.5

$$6.9 + 9.8 = 16.7$$

M0.5

$$16.7 - 27.36 = -10.66$$

A1

6

(a) $h \times w = 44$

$$5.5 \times w = 44$$

$$w = 8\text{cm}$$

A1

$$l \times h = 66$$

$$l \times 5.5 = 66$$

