

GB ASSESSMENT TEST

VIRTUAL MOCK EXAMINATION (4)

MATHEMATICS- MAY, 2020

MOCK EXAMINATION- MARKING SCHEME

OBJECTIVE TEST

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

THEORY

Q no	SOLUTION
1	a) 15 3×5 20 $2^2 \times 5$ 25 5^2 $L C M = 2^2 \times 3 \times 5^2$ $= 300$ Convert 300 minutes to hours $300 \text{ MINS} = 5 \text{ HOURS}$ $\therefore 5 + 9 = 14$ $= 2:00 \text{ pm}$ M1.5 M1 b) $5^2 = 3^2 + b^2$ $25 = 9 + b^2$ $25 - 9 = b^2$ $\sqrt{16} = \sqrt{b^2}$ $b = 4 \text{ cm}$ $\therefore \text{the third side} = 4 + 4 = 8 \text{ cm}$ $a^2 + 3^2 = 5^2$ $a^2 = 5^2 - 3^2$ $a^2 = 25 - 9$ $\sqrt{a^2} = \sqrt{16}$ $a = 4 \text{ cm}$ $5^2 = a^2 + 3^2$ $a^2 = 5^2 - 3^2$ $a^2 = 25 - 9$ $\sqrt{a^2} = \sqrt{16}$ $a = 4 \text{ cm}$ M1 M1 M1 A1 (c) Selling price of pens = 20×6.50 M0.5 $= \text{Gh}¢ 130.00$ A0.5 Commission on pens = $\frac{15}{100} \times 130$ M0.5 $= \text{Gh}¢ 19.50$ A0.5 Selling price of pencils = 35×4 M0.5

	$= \text{Gh¢ } 140.00$ $\text{Commission on pencils} = \frac{10}{100} \times 140$ $= \text{Gh¢ } 14.00$	A0.5 M0.5 A0.5
	$\text{Total commission} = 19.50 + 14.00$ $= \text{Gh¢ } 33.50$	A1
	(d) $(n - 2) \times 180$ where $n = 5$ $\Rightarrow (5 - 2) \times 180 = 540 \text{ (sum of interior angle)}$ $\Rightarrow (2x + 10) + 90 + 90 + (2x + 10) + x = 540$ $4x + 20 + 180 + x = 540$ $4x + x + 200 = 540$ $5x = 540 - 200$ $5x = 340$ $x = 68^\circ$	M0.5 M0.5 M0.5 A1
2	a) Let Bottle A = A Bottle B = B Bottle C = C Bottle D = D $A = B + 3 \text{ litres}$ $D = (B + 3 \text{ litres}) + 5 \text{ litres}$ $= B + 8 \text{ litres}$ $C = (B + 3 \text{ litres}) - 3 \text{ litres}$ $= B + 3 \text{ litres} - 3 \text{ litres}$ $C = B$ i. Bottle B and Bottle C ii. Bottle D – Bottle B $= (B + 8 \text{ litres}) - B$ $= B - B + 8 \text{ litres}$ $= 8 \text{ litres}$ Bottle D can hold 8 litres more juice than Bottle B b) Cost price of the three bedroom apartment = GH¢ 65,000 Initial amount paid by Mrs Sefa = 15% of cost price $= \frac{15}{100} \times 65,000$ $= 15 \times 650$ $= \text{GH¢ } 9,750.00$ Amount remaining to be paid by Mrs Sefa = GH¢ 65,000 - GH¢ 9,750 $= \text{GH¢ } 55,250$ Amount remaining to be paid attracts an interest of 10% per annum Simple interest = $\frac{\text{Principal} \times \text{rate} \times \text{time}}{100}$ $= \frac{55250 \times 10 \times 1}{100}$ $= 5525 \times 1 \times 1$ $= \text{GH¢ } 5,525.00$ Total amount to be paid by Mrs Sefa $= \text{GH¢ } 65,000 + \text{GH¢ } 5525$	M0.5 M0.5 A1 M0.5 M0.5 M0.5 M0.5 M0.5 M0.5 M0.5

= GH¢ 70,525.00

A1

c)

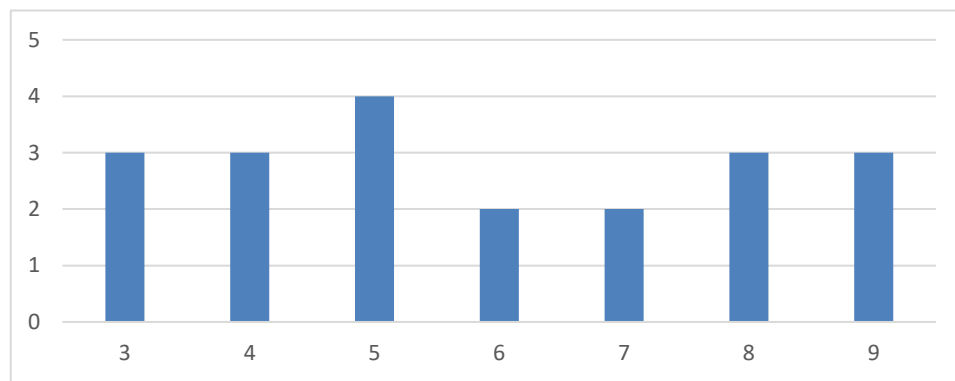
Score	Tally	Frequency
3	///	3
4	///	3
5	////	4
6	//	2
7	//	2
8	///	3
9	///	3
		$\Sigma f = 20$

M1.5

i.

BAR CHART

Frequency



A4

Score

ii. No of students who took part in the competition

= 3 + 3 + 4 + 2 + 2 + 3 + 3 = 20 students

A0.5

3

$$(a) \frac{1\frac{2}{5} - 2\frac{1}{3}}{2 - \frac{1}{4}}$$

$$= \frac{\frac{7}{5} - \frac{7}{3}}{2 - \frac{1}{4}}$$

M1

$$= \frac{7}{5} - \frac{7}{3} \div 2 - \frac{1}{4}$$

M1

$$= \left(\frac{7}{5} - \frac{7}{3} \right) \div \left(2 - \frac{1}{4} \right)$$

$$= \frac{21 - 35}{15} \div \frac{8 - 1}{4}$$

$$= \frac{-14}{15} \div \frac{7}{4}$$

$$= \frac{-14}{15} \times \frac{4}{7}$$

$$= \frac{-14^2}{15} \times \frac{4}{7^1}$$

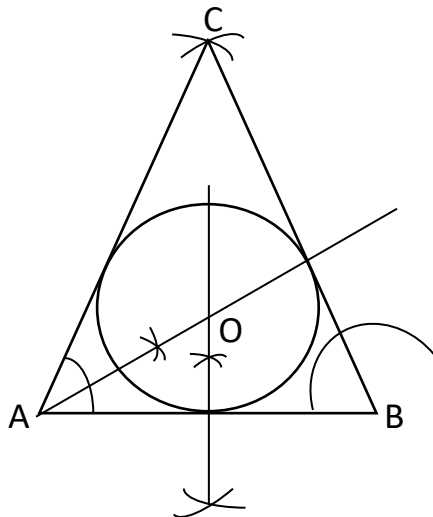
M1

$$= \frac{-8}{15}$$

$$= -0.5333 \quad \text{A1}$$

(b) volume of a pyramid = $\frac{1}{3} \times \text{Area of the square base} \times \text{height}$ M1
 Area of the square base = $8\text{cm} \times 8\text{cm} = 64\text{cm}^2$ M1
 Height = 15cm
 Volume of the pyramid = $\frac{1}{3} \times 64\text{cm}^2 \times 15\text{cm}$ M1
 $= 64\text{cm}^2 \times 5\text{cm}$
 $= 320\text{cm}^3$ A1

(c)

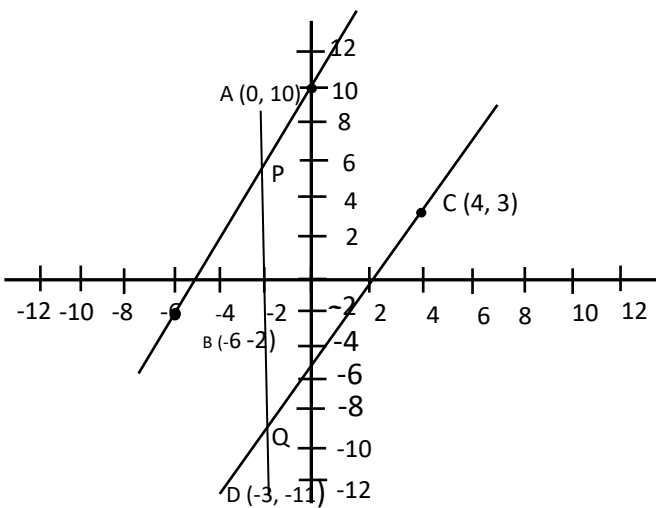


$|AB| = 8\text{cm}$, $|BC| = 8\text{cm}$, $\angle ABC = 60^\circ$ M2.5
 Completing triangle and locating A, B, & C M1
 Bisector of $\angle BAC$ to meet BC at D M1
 Perpendicular bisector of BA to meet AB at O M1
 Using O as the centre to draw the circle M0.5

ii. $|AD| = 6.9\text{cm} / 7.0\text{cm}$ (+ or - 2) A0.5

(d) ii. triangle ABC is an equilateral triangle A0.5

4



A4

	iv. Angle BPQ = 25° and Angle PQC= 25° A1 (b) i. Angle BPQ and PQC are alternative angles A1 ii. Line AB is parallel to line CD A1 iii. The equation of the line passing through C and D C (4, 3) D (-3, -11) $\frac{y_2-y_1}{x_2-x_1} = \frac{-11-3}{-3-4} = \frac{-14}{-7}$ M1 Gradient = 2 A1 Using point C(4,3) $y-y_1=m(x-x_1)$ M0.5 $y-3 = 2 (x-4)$ M0.5 $y-3 = 2x - 8$ M0.5 $y=2x -8 + 3$ M0.5 $y= 2x - 5$ therefore the equation of the line C D is $y= 2x - 5$ A0.5 (c) Area of trapezium = $\frac{1}{2} (\text{sum of parallel sides}) \times \text{height}$ M0.5 $94cm^2 = \frac{1}{2} (9cm + 11cm) \times h$ M0.5 $2 \times 94cm^2 = (20cm) h$ M0.5 $\frac{188cm^2}{20cm} = \frac{(20cm)h}{20cm}$ M1 $h = 9.4cm$ The perpendicular distance (height) is 9.4cm A1
5	(a) Let their marks be (x+9) and x M0.5 Sum of their marks= (x+ 9) + x = (x+9+x) M0.5 Then $x+9 = \frac{56}{100} (x+ 9 + x)$ M0.5 $x+9 = \frac{14}{25} (9 + 2x)$ $25(x+9) = 14 (2x+9)$ $25x + 225 = 28x + 126$ M0.5 $25x - 28x = 126 - 225$ $-3x = -99$ $x = 33$ A1 The marks of the other student = (x+9) = 33+9 = 42 A1 Therefore the marks obtained by the two students are 33 and 42 (b) i. $s = \left(\frac{2u+at}{2} \right) t$ Cross multiply $2s = (2u+at)t$ M0.5 $2s = 2tu + at^2$ M0.5 $2s - at^2 = 2tu$ M0.5 $\frac{2s - at^2}{2t} = \frac{2tu}{2t}$ $U = \frac{2s - at^2}{2t}$ A0.5

	ii). When $s=8$, $a=3$, and $t=2$ $U = \frac{2s - at^2}{2t}$ $U = \frac{2(8) - 3(2)^2}{2(2)}$ M0.5 $U = \frac{16 - 12}{4}$ M0.5 $U = \frac{4}{4}$ M0.5 $U = 1$ A0.5 (c). Let angle = x Compliment angle = $90 - x$ M0.5 Difference = 12° $(90 - x) - x = 12$ M0.5 $90 - 2x = 12$ M0.5 $-2x = 12 - 90$ M0.5 $-2x = -78$ $x = 39$ A0.5 Therefore compliment angle is $90 - x$; $90 - 39 = 51^\circ$ A0.5 Hence the two compliment angles are 39° and 51° (d) i. (Let P and Q Represents the multiples of 3 and 5 respectively Multiples of 3 = P {3,6,9,12,15,18} M0.5 Multiples of 5 = Q {5,10,15,20} M0.5 $P \cup Q$ {3,5,6,9,10,12,15,18,20} = 9 elements M0.5 Probability = $\frac{n(P \cup Q)}{n(\text{total number of element})} = \frac{9}{20}$ A0.5 ii. 3451.0000 0.0142 845.2800 + 27.4000 M1 4323.6942 4323.6942 = 4323.7 (5 s.f) A1
6	(a) a. Sum of the marks when 35 was recorded as Twum's mark $20 \times 65 = 1300$ M0.5 The difference between the correct and incorrect mark $55 - 35 = 20$ M0.5 The correct sum of the marks $1300 + 20 = 1320$ M0.5 The correct average mark for the test $\frac{1320}{20} = 66$ A0.5 Therefore the correct average mark for the test is 66 b. i) 5% of (25% of Gh¢ 1600) 25% of GH¢1600 M0.5 $= \frac{25}{100} \times 1600 = \text{GH¢ } 400$ A0.5 $= 5\% \text{ of } (25\% \text{ of } 1600) \text{ or } 5\% \text{ of } 400$ $= \frac{5}{100} \times 400 = \text{GH¢ } 20$ A1

ii. $5e^2 : 16 = 125:4$

$$\frac{5e^2}{16} = \frac{125}{4}$$

M0.5

$$5e^2 \times 4 = 125 \times 16$$

M0.5

$$20e^2 = 2000$$

M0.5

$$\frac{20e^2}{20} = \frac{2000}{20}$$

M0.5

$$e^2 = 100$$

$$e = \sqrt{100}$$

M0.5

$$e = 10$$

A0.5

(c) i. NB: Coordinate + vector = coordinate

Coordinate of y

$\overrightarrow{YX} = x - y$ represent the coordinates of y with $\begin{pmatrix} a \\ b \end{pmatrix}$

$$\begin{pmatrix} 3 \\ -4 \end{pmatrix} = \begin{pmatrix} 2 \\ 4 \end{pmatrix} - \begin{pmatrix} a \\ b \end{pmatrix}$$

$$2 - a = 3$$

$$4 - b = -4$$

$$2 - a = 3 \quad \text{M0.5}$$

$$4 - b = -4 \quad \text{M0.5}$$

$$-a = 3 - 2$$

$$-b = -4 - 4$$

$$-a = 1$$

$$-b = -8$$

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

$$\frac{-b}{-1} = \frac{-8}{-1}$$

$$a = -1 \quad \text{A0.5}$$

$$b = 8 \quad \text{A0.5}$$

Coordinate of y = (-1, 8)

Coordinate of Z represent the coordinates of z with $\begin{pmatrix} c \\ d \end{pmatrix}$

$$\overrightarrow{XZ} = Z - X$$

$$\begin{pmatrix} 1 \\ 8 \end{pmatrix} = \begin{pmatrix} c \\ d \end{pmatrix} - \begin{pmatrix} 2 \\ 4 \end{pmatrix}$$

$$c - 2 = 1$$

$$d - 4 = 8$$

$$c - 2 = 1$$

$$d - 4 = 8$$

$$c = 3$$

$$d = 12$$

Coordinate of Z

Z (3, 12)

A1

ii. $\overrightarrow{YZ} = Z - Y$

$$\overrightarrow{YZ} = \begin{pmatrix} 3 \\ 12 \end{pmatrix} - \begin{pmatrix} -1 \\ 8 \end{pmatrix} \quad \text{M0.5}$$

$$\overrightarrow{YZ} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} \quad \text{M0.5}$$

$$|YZ| = \sqrt{4^2 + 4^2} \quad \text{M0.5}$$

$$|YZ| = \sqrt{16+16}$$

$$|YZ| = \sqrt{32} \text{ units} \quad \text{A0.5}$$

$$(d) \frac{5x-2}{6} - \frac{2x-3}{4} - \frac{x-1}{2} = \frac{1}{4}$$

Multiply through by the LCM (ie. 12)

$$12 \times \frac{5x-2}{6} - 12 \times \frac{(2x-3)}{4} - 12 \times \frac{x-1}{2} = \frac{1}{4} \times 12 \quad \text{M0.5}$$

$$2(5x-2) - 3(2x-3) - 6(x-1) = 3(1) \quad \text{M0.5}$$

$$10x-4 - 6x+9 - 6x+6 = 3 \quad \text{M0.5}$$

$$10x - 6x - 6x = 3 + 4 - 9 - 6$$

$$-2x = -8 \quad \text{M0.5}$$

$$\frac{-2x}{-2} = \frac{-8}{-2}$$

$$x = 4$$

M0.5

Therefore the truth set { x:x = 4}

M0.5