

MARKING SCHEME

1. $\frac{17}{7} - \frac{11}{6} = \frac{102-77}{42} = \frac{25}{42}$ $\frac{25}{42} \times \frac{6}{5} = \frac{5}{7} \checkmark \textcircled{1}$ $\frac{2}{3}$ of $\frac{9}{4}$ $\frac{3}{2} - \frac{8}{7} = \frac{21-16}{14} = \frac{5}{14} \checkmark \textcircled{1}$ $\frac{8}{7} \times \frac{14}{5} = 2. \checkmark \textcircled{1}$	4. $3x - 35 + x + 20 = 90 \checkmark \textcircled{1}$ $4x - 15 = 90$ $4x = 105$ $x = 26\frac{1}{4} \checkmark \textcircled{1}$																
2. (i) $\frac{3y}{3} = \frac{-4x+12}{3}$ $y = -\frac{4}{3}x + 4$ $9 = -\frac{4}{3} \checkmark \textcircled{1}$	5. $3x + x - 20 = 180 \checkmark \textcircled{1}$ $4x = 200$ $x = 50^\circ \checkmark \textcircled{1}$ exterior $= 50 - 20 = 30^\circ \checkmark \textcircled{1}$ $n = \frac{360}{\text{ext}} = \frac{360}{30} = 12 \text{ sides} \checkmark \textcircled{1}$																
(ii) $-\frac{4}{3}x = -1 \quad x = \frac{3}{4} \checkmark \textcircled{1}$ $\frac{y-2}{x-1} = \frac{3}{4}$	6. LCM <table border="1"> <tr><td>3</td><td>9</td><td>15</td><td>21</td></tr> <tr><td>3</td><td>3</td><td>5</td><td>7</td></tr> <tr><td>5</td><td>1</td><td>5</td><td>7</td></tr> <tr><td>7</td><td>1</td><td>1</td><td>7</td></tr> </table> $3 \times 3 \times 5 \times 7 = 315 \text{ minutes} \checkmark$ $= 5 \text{ hrs } 15 \text{ mins} \checkmark \textcircled{1}$ $\begin{array}{r} 11:00 \\ - 5:15 \\ \hline 5:45 \end{array}$ 5:45 PM. $\checkmark \textcircled{1}$	3	9	15	21	3	3	5	7	5	1	5	7	7	1	1	7
3	9	15	21														
3	3	5	7														
5	1	5	7														
7	1	1	7														
$4y - 8 = 3x - 3$ $4y = 3x + 5$ $y = \frac{3}{4}x + \frac{5}{4} \checkmark \textcircled{1}$	7. $4 - 2x < 4x - 9$ $\frac{13}{6} < \frac{6x}{6}$ $2\frac{1}{6} < x \checkmark \textcircled{1}$																
3. $3 \times \frac{1}{0.2311}$ 2.311×10^{-1} $0.4327 \times 10^1 = 4.327$ $\begin{array}{r} \times 3 \\ \hline 12.981 \end{array} \checkmark \textcircled{1}$ $(7.918 \times 10^{-1})^2$ $62.70 \times 10^{-2} = 0.6270 \checkmark \textcircled{1}$ $12.981 + 0.6270$ $1 = 13.608 \checkmark \textcircled{1}$	$4x - 9 < x + 11$ $\frac{3x}{3} < \frac{20}{3}$ $x < 6\frac{2}{3} \checkmark \textcircled{1}$ $2\frac{1}{6} < x < 6\frac{2}{3}$ integral values; (3, 4, 5, 6) $\checkmark \textcircled{1}$																

$$8 \quad \text{LCM} = \begin{array}{c|c|c|c} 2 & 2 & 3 & 4 \\ \hline 2 & 1 & 3 & 2 \\ \hline 3 & 1 & 3 & 1 \end{array}$$

$$2 \times 2 \times 3 = 12$$

$$\frac{12}{2} = 6 \text{ plates of Ugali}$$

$$\frac{12}{3} = 4 \text{ plates of soup}$$

$$\frac{12}{4} = 3 \text{ plates of meat}$$

$$12 \text{ people} = 13 \text{ plates}$$

$$65 \text{ plates}$$

$$\frac{12 \times 65}{5} = 60 \text{ people}$$

$$9. \quad 4x^2 = 2 \quad 3(4x-3)$$

$$4x^2 = 12x - 9$$

$$4x^2 - 12x + 9 = 0$$

$$4x^2 - 6x - 6x + 9 = 0$$

$$2x(2x-3) - 3(2x-3) = 0$$

$$(2x-3)(2x-3) = 0$$

$$x = 1.5$$

$$10. \quad \text{Mary} \xrightarrow{40\text{km}} \text{John}$$

$$\frac{1}{2} \times 80 = 40\text{km}$$

$$\text{Relative Speed} = 80 + 100 = 180\text{km/hr}$$

$$T = \frac{D}{S} = \frac{5}{180} \approx 33 \text{ mins}$$

$$\frac{7.30}{33} = 8.03 \text{ am}$$

$$11. (a) \begin{pmatrix} 10 \\ 10 \end{pmatrix} - \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 12 \\ 7 \end{pmatrix}$$

$$(b) \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 12 \\ 7 \end{pmatrix} = \begin{pmatrix} 13 \\ 10 \end{pmatrix}$$

$$(c) m \begin{pmatrix} -2 \\ 3 \end{pmatrix} - n \begin{pmatrix} 1 \\ 3 \end{pmatrix} = \begin{pmatrix} -12 \\ -9 \end{pmatrix}$$

$$3(-2m - n) = -12$$

$$2(3m - 3n) = 9$$

$$-6m - 3n = -36$$

$$6m - 6n = 18$$

$$-9n = -18$$

$$n = 2$$

$$-2m = -10 \quad m = 5$$

$$12. \quad \text{US Dollar Buying } 77.23$$

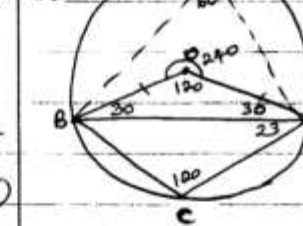
$$(a) 100,000 = 7,723,000$$

$$(b) \frac{7,723,000}{122.93} = 62,824 \text{ pence}$$

$$120 + 23 = 143^\circ$$

$$180 - 143 = 37^\circ$$

$$\angle ABC = 37^\circ$$



SECTION B

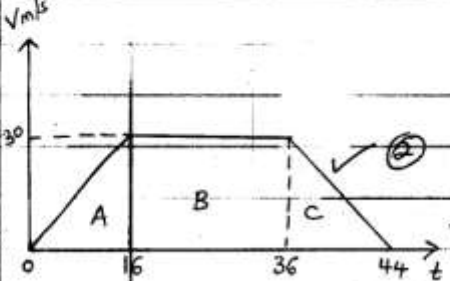
14

LCM

2	27	30	45
3	27	15	45
3	9	5	15
3	3	5	5
5	1	1	1

$$270 + 3 = 273$$

15.



b = Area under velocity time graph

$$A = \frac{1}{2} \times 16 \times 30 = 240 \text{ M} \checkmark$$

$$B = 20 \times 30 = 600 \text{ M} \checkmark$$

$$C = \frac{1}{2} \times 8 \times 30 = 120 \text{ M} \checkmark$$

$$\text{Total distance} = 960 \text{ M} \checkmark$$

16.

Area of rhombus;

$$\frac{1}{2} \times 9 \times 9 \sin 60^\circ \times 2$$

$$= 81 \sin 60^\circ$$

$$= 70.148 \text{ cm}^2 \checkmark$$

Area of sector

$$3.142 \times 9 \times 9 \times \frac{60}{360} = 42.417$$

$$70.148 - 42.417$$

$$= 27.731 \text{ cm}^2 \checkmark$$

17

$$(a) \frac{6}{100} \times 625000$$

$$= 37500 \text{ / = } \checkmark$$

$$\text{Shs } 2.50 = 1 \text{ km}$$

$$10,000$$

$$= 25,000 \checkmark$$

$$\text{Total} = 50,000 + 37500 + 25000$$

$$= \text{Shs } 112500 \checkmark$$

$$b(i) \quad 134000 - 50,000$$

$$= 84000 \checkmark$$

$$12000 \times 2.5 = 30,000 \checkmark$$

$$\text{Commission} = 84000 - 30,000$$

$$= 54000 \checkmark$$

$$\frac{100 \times 6}{6 \times 100} \times \frac{54000 \times 100}{8}$$

$$\text{Value of goods} \checkmark$$

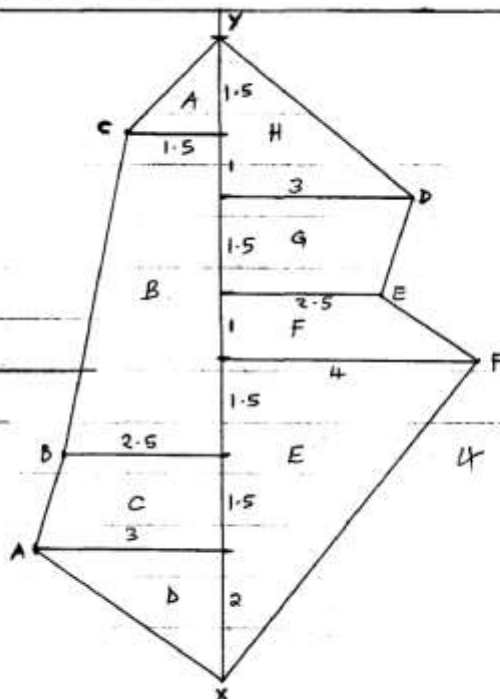
$$= 900,000 \text{ / =}$$

$$(ii) \quad \frac{900,000}{625000}$$

$$= 275000 \checkmark$$

$$\frac{275000}{625000} \times 100 = 44\% \checkmark$$

QUESTION 18.



(b) $A = \frac{1}{2} \times 1.5 \times 1.5 = 1.125 \text{ cm}^2$

$B = \frac{1}{2} \times 4 \times 5 = 10 \text{ cm}^2$

$C = \frac{1}{2} \times 5.5 \times 1.5 = 4.125 \text{ cm}^2$

$D = \frac{1}{2} \times 2 \times 3 = 3 \text{ cm}^2$ ✓ ①

$E = \frac{1}{2} \times 4 \times 5 = 10 \text{ cm}^2$

$F = \frac{1}{2} \times 6.5 \times 1 = 3.25 \text{ cm}^2$

$G = \frac{1}{2} \times 5.5 \times 1.5 = 4.125 \text{ cm}^2$

$H = \frac{1}{2} \times 3.5 \times 3 = 5.25 \text{ cm}^2$

39.375 cm^2 ✓ ①

1 cm rep 40m

$1 \text{ cm}^2 = 1600 \text{ m}^2$ ✓ ①

$39.375 \times 1600 = \frac{63000 \text{ m}^2}{10,000}$

$= 6.3 \text{ ha.}$ ✓ ①

(c) $6.3 \times 80,000 = \text{Shs } 504,000.$

19. $\pi r^2 \times \frac{1}{360}$

(a)

$$A = \frac{22}{7} \times 21 \times 21 \times \frac{1}{360} \checkmark \textcircled{1}$$

$$= 462 \text{ cm}^2 \checkmark \textcircled{1}$$

(b) $\pi D \times \frac{1}{360}$

$$\frac{22}{7} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{360} = 44 \text{ cm} \checkmark \textcircled{1}$$

$$44 + 42 = 86 \text{ cm} \checkmark \textcircled{2}$$

(c) $44 \text{ cm} = \frac{22}{7} D \checkmark \textcircled{1}$

(1)

$$D = \frac{7}{22} \times 44 = \frac{154}{2} = 77 \text{ cm} \checkmark \textcircled{1}$$

(ii)



$$\sqrt{21^2 - 7^2} \checkmark \textcircled{1}$$

$$\sqrt{392}$$

$$= 19.8 \text{ cm} \checkmark \textcircled{1}$$

20. Hero's formula;

(a) $S = \frac{1}{2}(100 + 190 + 150)$
 $= 220 \text{ M} \checkmark \textcircled{1}$

$$A = \sqrt{220(220-150)(220-100)(220-190)}$$

$$A = \sqrt{85544 \times 10^6} \checkmark \textcircled{1}$$

$$7.446 \times 10^3 = 7446 \text{ M}^2$$

(b) $\angle ACB = \frac{190^2 + 150^2 - 100^2}{2 \times 150 \times 190}$

$$\cos C = \frac{48600}{57000} = 0.8526 \checkmark \textcircled{1}$$

$$C = \cos^{-1} 0.8526 \checkmark \textcircled{1}$$

$$\angle ACB = 31.5^\circ \checkmark \textcircled{1}$$

(c) 7446×3

$$ABCD = 22338 \text{ M}^2 \checkmark \textcircled{1}$$

Area of ACD

$$22338 - 7446$$

$$= 14892 \text{ M}^2 \checkmark \textcircled{1}$$

$$\frac{1}{2} \times 190 \times 150 \sin A = 14892 \text{ M}^2$$

$$7446 = \frac{1}{2} \times 150 \times h$$

$$\frac{7446}{75} = \frac{75h}{75} \checkmark \textcircled{1}$$

$$h = 99.28 \text{ M}$$

ABCD 49.64

$$= \frac{1}{2} \times (150 + AD) \times 99.28 = 22338$$

$$150 + AD = 450$$

$$AD = 300 \text{ M} \checkmark \textcircled{1}$$

$$\angle CAD = 31.5^\circ$$

$$(CD)^2 = 190^2 + 300^2 - 2 \times 190 \times 300 \cos 31.5^\circ$$

$$(CD)^2 = 36100 + 90000 - 97201$$

$$(CD)^2 = 28899$$

$$CD = 170M \checkmark (2)$$

$$\text{Perimeter} = 100 + 150 + 170 + 300 \\ = 720M \checkmark (1)$$

Difference

$$= 324000 - 235800$$

$$= \text{Shs } 88,200 \checkmark (1) A_1$$

$$(c) \left(\frac{64}{225} \times 405000 \right) + 135000$$

$$= 250,200 \checkmark (1)$$

$$\frac{250,200}{810000} \times 100$$

$$= 30\frac{8}{9}\% \checkmark (2)$$

$$21 \quad \frac{4\phi}{1\phi\phi} \times 1,350,000$$

(a)

$$= 540,000 \checkmark (1)$$

$$(b) \quad \frac{2\phi}{1\phi\phi} \times 1,350,000$$

$$= 405000$$

$$\frac{405000}{3} = 135000 \text{ each } \checkmark (1)$$

$$B : J : T$$

$$112 : 128 : 210$$

$$56 : 64 : 105$$

$$\text{Bela} = \frac{56}{225} \times 405000$$

$$= 100,800 \checkmark (1)$$

$$\text{Total (Bela)} = 135000 + 100800$$

$$= 235,800 \checkmark (1)$$

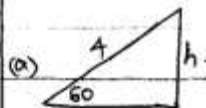
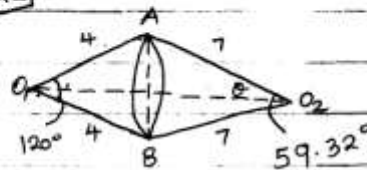
$$\text{Trinity} = \frac{105}{225} \times 405000$$

$$= 189000$$

$$\text{Total} = 189000 + 135000$$

$$= 324,000 \checkmark (1)$$

22



$$\sin 60^\circ = \frac{h}{4} \quad h = 3.464$$



$$\sin \theta = \frac{3.464}{7}$$

$$\theta = \sin^{-1} 29.66^\circ \checkmark (1)$$

$$(b) \quad \frac{1}{2} \times 4 \times 4 \sin 120 = 6.93 \text{ cm}^2 \checkmark (1)$$

$$\frac{1}{2} \times 7 \times 7 \sin 59.32 = 21.07 \text{ cm}^2 \\ = 28 \text{ cm}^2 \checkmark (2)$$

Unshaded area

Sector 1

$$\frac{\pi r^2 \theta}{360}$$

$$3.142 \times 4 \times 4 \times \frac{120}{360} = 16.76 \text{ cm}^2 \quad \textcircled{1}$$

$$\Delta O, AB = 6.93$$

$$16.76 - 6.93 = 9.83 \text{ cm}^2 \quad \textcircled{1}$$

Sector 2

$$3.142 \times 7 \times 7 \times \frac{59.32}{360} = 25.37 \quad \checkmark$$

$$25.37 - 21.07 \quad \textcircled{1}$$

$$= 4.3 \text{ cm}^2 \quad \checkmark$$

Sum

$$9.83 + 4.3 = 14.13 \text{ cm}^2 \quad \textcircled{1}$$

Shaded area

$$28 - 14.13$$

$$= 13.87 \text{ cm}^2 \quad \textcircled{1}$$

23 Original contribution = $\frac{225000}{n} \quad \textcircled{1}$

(a)

After 10 withdrew = $\frac{225000}{n-10} \quad \textcircled{1}$

$$\frac{225000}{n-10} - \frac{225000}{n} \quad \checkmark \quad \textcircled{1}$$

$$n(n-10)$$

$$\frac{225000n - 225000n + 2250000}{n(n-10)}$$

$$= \frac{2250000}{n(n-10)} \quad \checkmark \quad \textcircled{1}$$

$$\frac{2250000}{n(n-10)} = 1125 \quad \checkmark \quad \textcircled{1}$$

$$n(n-10)$$

$$n(n-10) = 2000$$

$$n^2 - 10n - 2000 = 0 \quad \checkmark \quad \textcircled{1}$$

$$n^2 - 50n + 40n - 2000 = 0$$

$$n(n-50) + 40(n-50) = 0 \quad \checkmark \quad \textcircled{1}$$

$$(n+40)(n-50) = 0$$

$$n = 50 \text{ members} \quad \checkmark \quad \textcircled{1}$$

(c) $\frac{225000}{50} = 4500 \quad \checkmark \quad \textcircled{1}$

$$\frac{225000}{40} = 5625$$

$$\frac{1125}{4500} \times 100 \quad \checkmark \quad \textcircled{1}$$

$$= 25\% \quad \checkmark \quad \textcircled{1}$$

24 $\angle CDE = 100^\circ \quad \checkmark \quad \textcircled{1}$

= Opposite angles in a cyclic quadrilateral BCDE.

$$\angle DFE = 30^\circ \quad \checkmark \quad \textcircled{1}$$

= Angle sum of triangle DEF add up to 180° .

$$\angle COE = 160^\circ \quad \checkmark \quad \textcircled{1}$$

> Radius subtends equal angles at the circumference.

$$\angle ABE = 40^\circ \quad \checkmark \quad \textcircled{1}$$

Angle subtended by chord AE at the circumference.

$$\angle CAE = 80^\circ \quad \checkmark \quad \textcircled{1}$$

- Angle subtended by chord CE at the circumference.