



STAREHE GIRLS' CENTRE MOCK EXAMINATION 2025

MATHEMATICS

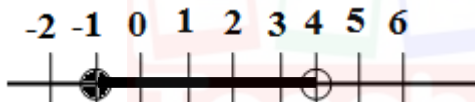
Form 4

Paper 1

MARKING SCHEME

SECTION I

	WORKING	MARKS	GUIDELINES
1.	Numerator: $-2(-5 + 8) - 9 \div 3 - 5$ $-6 - 9 \div 3 + 5$ $-6 - 3 - 5 = -14$ Denominator: $-3 \times -5 + -2 \times 4$ $15 - 8 = 7$ Quotient $\frac{-14}{7} = -2$	M1 M1 A1	
		4	
2.	(a) (i) $86.46^2 = 7475$ (ii) $\frac{1}{27.56} = \frac{1}{2.756 \times 10^2} = 0.03628$ (b) $\frac{86.46^2}{27.56} = 7475 \times 0.03628$ $= 271.2$	B1 B1 M1 A1	
		3	
3.	$\frac{90}{90}(2n - 4) = \frac{1440}{90}$ $(2n - 4) = 16$ $2n = 20$ $n = 10$ Decagon	M1 A1 B1	
		3	
4.	$A.S.F = \frac{750}{120} = \frac{25}{4}$ $L.S.F = \sqrt{\frac{25}{4}} = \frac{5}{2}$ $V.S.F = \left(\frac{5}{2}\right)^3 = \frac{125}{8}$ Volume of larger = $\frac{125}{8} \times \frac{400}{1000} = 6.25$ litres	M1 M1 A1	
		3	

5.	$P = 2 \begin{pmatrix} -1 \\ 4 \end{pmatrix} - 4 \begin{pmatrix} -3 \\ -2 \end{pmatrix} + 3 \begin{pmatrix} -2 \\ -1 \end{pmatrix}$ $= \begin{pmatrix} -2 \\ 8 \end{pmatrix} - \begin{pmatrix} -12 \\ -8 \end{pmatrix} + \begin{pmatrix} -6 \\ -3 \end{pmatrix}$ $= \begin{pmatrix} 4 \\ 13 \end{pmatrix}$	M1 M1 A1											
		3											
6.	$-3x > -7 - 5$ $-3x > -12$ $\frac{-3x}{-3} < \frac{-12}{-3}$ $x < 4$ $x - 3x > -4 + 6$ $-2x \leq 2$ $\frac{-2x}{-2} \geq \frac{2}{-2}$ $x \geq -1$ 	M1 M1 A1											
		3											
7.	Cost of the car in Kshs = 4800×72.34 = Kshs 347 232 Commision in Kshs = $\frac{15}{100} \times \text{Kshs } 347\,232$ = Kshs 52 084.80 Cost of shipment in Kshs = $\frac{72\,220}{117.2}$ = US \$ 616.216 $\times$ 72.34 = Kshs 44 576.70 Total cost = $347\,232.00 + 52\,084.80 + 44\,576.70$ = Kshs 443 893.50	M1 M1 A1											
		3											
8.	<table><tr><td>3</td><td>189</td></tr><tr><td>3</td><td>63</td></tr><tr><td>3</td><td>21</td></tr><tr><td>7</td><td>7</td></tr><tr><td></td><td>1</td></tr></table>	3	189	3	63	3	21	7	7		1	M1	Table
3	189												
3	63												
3	21												
7	7												
	1												

	$p^3 \times q = 3^3 \times 7$ $p = 3$ and $q = 7$	M1 A1			
		3			
9.	$1000 \left(\sqrt{\frac{0.0128}{200}} \right) = 1000 \left(\sqrt{\frac{0.0064}{100}} \right)$ $= 1000 \times \frac{0.08}{10}$ $= 8$	M1 M1 A1			
		3			
10.	$\frac{2x-3}{3} - \frac{x-2}{2} - \frac{1-x}{4} = \frac{4(2x-3) - 6(x-2) - 3(1-x)}{12}$ $= \frac{8x - 12 - 6x + 12 - 3 + 3x}{12}$ $= \frac{5x - 3}{12}$	M1 M1 A1			
		3			
11.	$14 \times \frac{30}{40} \times \frac{10}{7}$ $= 15 \text{ days}$	M1M1 A1			
		3			
12.	$\text{Area of the sector } OAB = \frac{100}{360} \times 3.142 \times 6^2$ $= 31.42\text{cm}^2$ $\text{Area of the triangle} = \frac{1}{2} \times 6 \times 6$ $= 17.73\text{cm}^2$ $\text{Area of the shaded region} = 31.42 - 17.73$ $= 13.69\text{cm}^2$	M1 M1 A1	for conversi on		
		3			
13.	<table><tr><td>$\begin{array}{r l} 2 & 1764 \\ \hline 2 & 882 \\ 3 & 441 \\ 3 & 147 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$</td><td>$\begin{array}{r l} 2 & 2744 \\ \hline 2 & 1372 \\ 2 & 686 \\ 7 & 343 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$</td></tr></table> $1764 = 2^2 \times 3^2 \times 7^2$ $2744 = 2^3 \times 7^3$ $\frac{\sqrt{1764}}{\sqrt[3]{2744}} = \frac{2 \times 3 \times 7}{2 \times 7}$	$\begin{array}{r l} 2 & 1764 \\ \hline 2 & 882 \\ 3 & 441 \\ 3 & 147 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 2744 \\ \hline 2 & 1372 \\ 2 & 686 \\ 7 & 343 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$	M1 M1 A1	
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	$= 3$		
		3	
14.	$\text{Density} = \frac{\text{mass}}{\text{volume}}$ $2.4 = \frac{18\,000}{15 \times 50 \times h}$ $h = \frac{18\,000}{15 \times 50 \times 2.4}$ $h = 10\text{ cm}$	M1 M1 A1	
		3	
15.	$\text{Area} = \frac{1}{2}ab \sin \phi$ $51 = \frac{1}{2} \times 12 \times 17 \sin \phi$ $\frac{51}{6 \times 1} = \frac{6 \times 17 \sin \phi}{6 \times 1}$ $\sin \phi = 0.5$ $\phi = 30^\circ$	M1 M1 A1	
		3	
16.	(a) GCD is xy^2 (b) $xy^2(9x^2 - 4y^2)$ $xy^2(3x - 2y)(3x + 2y)$	A1 M1 A1	
		3	

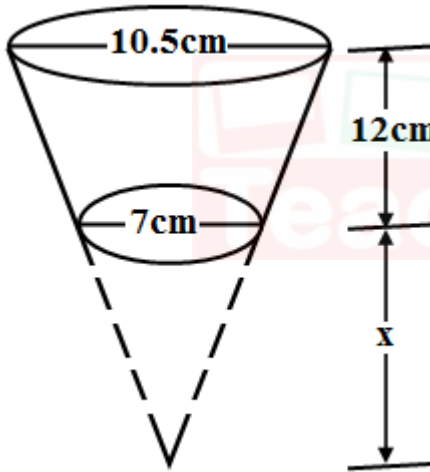
SECTION II

17.	(a) At the x - axis, $y = 0$ $0 = \frac{2}{3}x - \frac{2}{3}$ $\frac{2}{3}x = \frac{2}{3}$ $x = 1$ $T(1, 0)$ (b) $y = \frac{2}{3}x - \frac{2}{3}$	M1 A1 M1	
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	$m_1 = \frac{2}{3} \quad m_2 = \frac{-3}{2}$ $\frac{y-0}{x-1} = \frac{-3}{2}$ $2y = -3x + 3$ $2y + 3x = +3$ (c)(i) $m_1 = m_3 = \frac{2}{3}$ point $(-4,1)$ $\frac{y-1}{x+4} = \frac{2}{3}$ $y-1 = \frac{2}{3}x + \frac{8}{3}$ $y = \frac{2}{3}x + \frac{11}{3}$ (ii) $y = \frac{2}{3}x + \frac{11}{3}$ $(2y + 3x = 3) \times 3$ $(3y - 2x = 11) \times 2$ $6y + 9x = 9$ $6y - 4x = 22$ $\hline 13x = -13$ $x = -1$ $y = 3$ $S(-1,3)$	M1 A1 M1 A1 M1 M1 A1	
		10	
18.	(a) $v = \frac{1}{2}t^2 - 3t + 7$ $= \frac{1}{2}(8)^2 - 3(8) + 7$ $= 15 \text{ m/s}$ (b) $a = t - 3$ when $t = 0, a = -3$ Retardation of 3m/s^2	M1 A1 M1 A1	

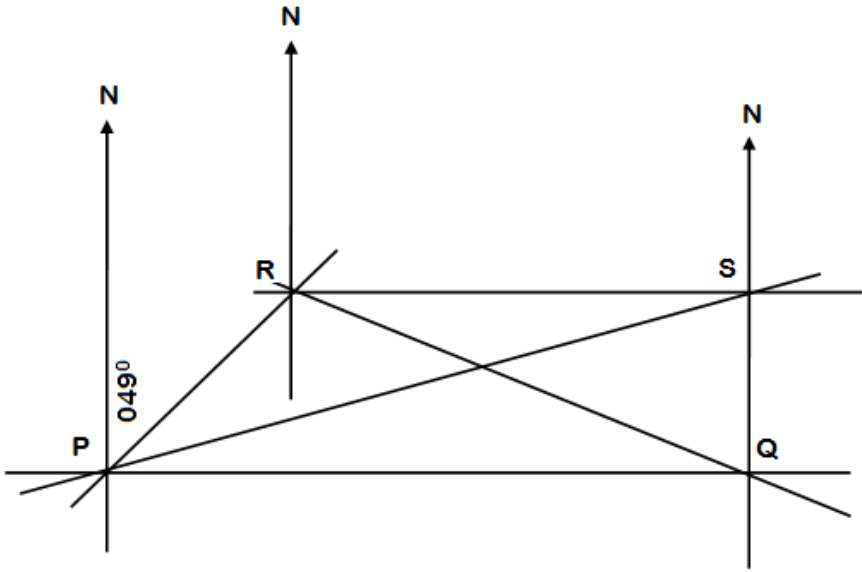
	(c) $\frac{dv}{dt} = 0$ at minimum velocity $t - 3 = 0$ $t = 3$ Minimum velocity $v = \frac{1}{2}(3)^2 - 3(3) + 7$ $= 2\frac{1}{2} \text{ m/s}$	M1	
		A1	
		M1	
		A1	
		M1	
		A1	
	(d) $s = \int \left(\frac{t^2}{2} - 3t + 7 \right) dt$ $s = \frac{t^3}{6} - \frac{3}{2}t^2 + 7t + c$ for $t = 2$, $s = \frac{8}{6} - 6 + 14$ $s = 9\frac{1}{3} \text{ m}$		
		10	
19.	(a) $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} 4 & 0 & -2 \\ 1 & 2 & 4 \end{pmatrix} = \begin{pmatrix} 5 & 2 & 2 \\ 11 & 6 & 8 \end{pmatrix}$ $A^I(5, 11), B^I(2, 6)C^I(2, 8)$	M1M1	
		A1	
		M1M1	
		A1	
	(b) $\begin{pmatrix} 2 & -1 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} 5 & 2 & 2 \\ 11 & 6 & 8 \end{pmatrix} = \begin{pmatrix} -1 & -2 & -4 \\ 27 & 14 & 18 \end{pmatrix}$ $A^I(5, 11), B^I(2, 6)C^I(2, 8)$		

	(c) $\begin{pmatrix} 2 & -1 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$ $= \begin{pmatrix} 0 & -1 \\ 5 & 7 \end{pmatrix}$ (d) $\frac{1}{5} \begin{pmatrix} 7 & -1 \\ 5 & 0 \end{pmatrix}$ $= \begin{pmatrix} \frac{7}{5} & \frac{1}{5} \\ -1 & 0 \end{pmatrix}$	M1 A1 M1 A1	
		10	
20.	(a) Distance of A before B started = $65 \times 2\frac{1}{6}$ $= 140.83km$ Distance shared = $460 - 140.83$ $= 319.17km$ Time to meet = $\frac{319.17km}{145}$ $= 2.2012hrs$ Distance from B = 80×2.2012 $= 176.09km$ (b) Time $\approx 2hrs 12 minutes$ Meeting time = $1055hrs + 2hrs 12 min$ $= 1307hrs$ $= 1.07pm$	M1 M1 M1 A1 M1 A1	

	(c) Time taken by minibus = $\frac{460}{65}$ $\approx 7 \text{ hrs } 05 \text{ minutes}$ Time to reach B = $0845 \text{ hrs} + 7 \text{ hrs } 5 \text{ mins}$ $= 1550 \text{ hrs}$ $= 3.50 \text{ pm}$ Time of the motorist = $1550 \text{ hrs} - 0915 \text{ hrs}$ $= 6 \text{ hrs } 35 \text{ minutes}$ Distance = $120 \times 6 \frac{35}{60}$ $= 790 \text{ km}$	M1 M1 M1 A1	
21.	 (a) $\frac{x}{x+12} = \frac{7}{10.5}$ $10.5x = 7x + 84$ $3.5x = 84$ $x = 24$ $L = \sqrt{36^2 + 5.25^2} = 36.38 \text{ cm}$ $l = \sqrt{24^2 + 3.5^2} = 24.25 \text{ cm}$ Curved surface area $= \left(\frac{22}{7} \times 5.25 \times 36.38 \right) - \left(\frac{22}{7} \times 3.5 \times 24.25 \right)$ $= 333.6 \text{ cm}^2$	M1 M1 M1 M1 M1	

	$\text{Total surface area} = 333.6 + \left(\frac{22}{7} \times 7 \times 7\right)$ $= 487.6\text{cm}^2$ $\text{(b) Volume} = \frac{22}{7} \times 5.25^2 \times 36 - \frac{22}{7} \times 3.5^2 \times 24$ $= 2194.5\text{cm}^3$ $\text{Capacity} = \frac{2194.5\text{cm}^3}{1000}$ $= 2.1945 \text{ litres}$ $= 22 \text{ decilitres}$	A1 M1M1 M1 A1																																																							
		10																																																							
22.	(a) 55 – 59 (b) Assumed mean = 57 <table><tr><th>Class</th><th>f</th><th>Mid point(x)</th><th>x – A = d</th><th>fd</th><th>fd²</th></tr><tr><td>40 – 44</td><td>3</td><td>42</td><td>–15</td><td>–45</td><td>675</td></tr><tr><td>45 – 49</td><td>30</td><td>47</td><td>–10</td><td>–300</td><td>3000</td></tr><tr><td>50 – 54</td><td>29</td><td>52</td><td>–5</td><td>–45</td><td>725</td></tr><tr><td>55 – 59</td><td>33</td><td>57</td><td>0</td><td>0</td><td>0</td></tr><tr><td>60 – 64</td><td>13</td><td>62</td><td>5</td><td>65</td><td>325</td></tr><tr><td>65 – 69</td><td>1</td><td>67</td><td>10</td><td>10</td><td>100</td></tr><tr><td>70 – 74</td><td>1</td><td>72</td><td>15</td><td>15</td><td>225</td></tr><tr><td></td><td>110</td><td></td><td></td><td>–400</td><td>5050</td></tr></table> $\text{Mean} = \frac{-400}{110} + 57$ $= 53.364$ $\text{(c) } s = \sqrt{\frac{5050}{110} - \left(\frac{-400}{110}\right)^2}$ $= \sqrt{32.69}$ $= 5.718$	Class	f	Mid point(x)	x – A = d	fd	fd ²	40 – 44	3	42	–15	–45	675	45 – 49	30	47	–10	–300	3000	50 – 54	29	52	–5	–45	725	55 – 59	33	57	0	0	0	60 – 64	13	62	5	65	325	65 – 69	1	67	10	10	100	70 – 74	1	72	15	15	225		110			–400	5050	B1 B1 M1 A1 M1 M1 A1	For the values of x
Class	f	Mid point(x)	x – A = d	fd	fd ²																																																				
40 – 44	3	42	–15	–45	675																																																				
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60 – 64	13	62	5	65	325																																																				
65 – 69	1	67	10	10	100																																																				
70 – 74	1	72	15	15	225																																																				
	110			–400	5050																																																				

	(d) 50th student $= 49.5 + \frac{17}{29} \times 5$ $= 49.5 + 2.9310$ $= 52.43$	M1 M1 A1	
		10	
23.	(a) $y^2 = 13.4^2 + 5^2 - 2 \times 13.4 \times 5 \cos 57.7^\circ$ $= 179.6 + 25 - 134 \times 0.5344$ $= 204.6 - 71.61$ $= 132.99$ $y = \sqrt{132.99} = 11.53 \text{ cm}$ (b) $\frac{5}{\sin Z} = \frac{11.53}{\sin 57.7^\circ}$ $\sin Z = \frac{5 \sin 57.7^\circ}{11.53}$ $\sin Z = 0.3666$ $Z = 21.51^\circ$ (c) $\text{Angle } YXZ = 180 - (21.51^\circ + 57.7^\circ)$ $= 100.79$	M1 M1 M1 A1 M1 M1 M1 M1 A1	

	$= 100.8$		
	0	10	
24.	(a)  (b) (i) Bearing of S from P = $075^\circ \pm 1^\circ$ (ii) Distance of Q from S = 2.6×20 $= 52 \pm 2km$ (iii) Bearing of Q from R = $111^\circ \pm 1^\circ$ (iv) Distance of R from S = 7.0×20 $= 140 \pm 2km$	B1 B1 B1 B1 B1 M1 A1 B1 M1 A1	
		10	

