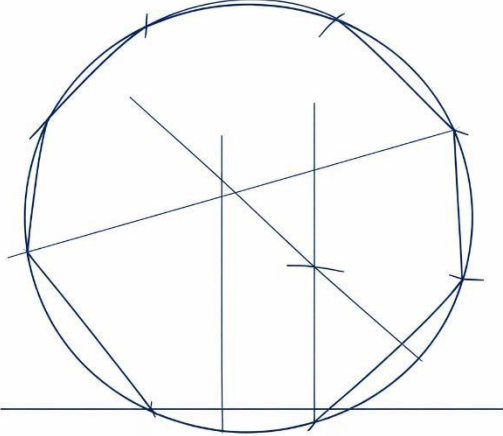


**MATHEMATICS FORM FOUR**  
**MID TERM 2 2026**  
**MARKING SCHEME**

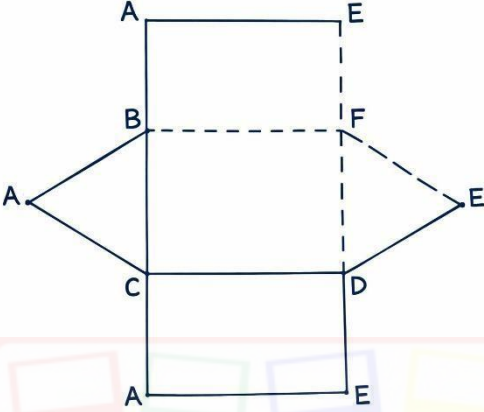
	WORKING	MARKS AWARDED	REMARKS
1.	$-5^2 \div (-5 + 5 \text{ of } -5)$ $= -25 \div (-5 - 25)$ $= \frac{5}{6}$ $5^{-1} + 5^0 = \frac{1}{5} + 1 = \frac{6}{5}$ $\frac{\sqrt{5}}{6} \div \frac{6}{5} = \frac{\sqrt{5}}{6} \times \frac{5}{6} = \frac{5\sqrt{5}}{36}$	<p>M1</p> <p>M1</p> <p>A1</p> <hr/> <p>3 MARKS</p>	
2.	$2t+1 = 4^3$ $\frac{1}{4} (2t+1) = 4^3$ $t-1 = 3$ $4-2t = 4$ $-2t = -2$	<p>M1</p> <p>M1</p> <p>A1</p> <hr/> <p>3 MARKS</p>	
3.	$3\theta - 45^\circ + \theta + 15^\circ = 90^\circ$ $\theta = 30^\circ$ $\tan 30^\circ = \frac{\sqrt{3}}{3}$	<p>M1</p> <p>A1</p> <p>B1</p> <hr/> <p>3 MARKS</p>	
4.	<p>L.C.M. of 30s, 36s and 48s = 720 seconds</p> <p>Number of shoppers served in 720 secs = <math>\frac{720}{30} + \frac{720}{36} + \frac{720}{48}</math></p> $= 59 \text{ shoppers}$ $\frac{236}{59} \times \frac{720}{60} = \frac{236 \times 12}{59} = 48 \text{ minutes}$ <p>Time taken to serve 236 shoppers =</p>	<p>B1</p> <p>M1</p> <p>A1</p> <hr/> <p>3 MARKS</p>	
5.	$V.S.F. = \frac{2560}{8640} = \frac{8}{27}$ $L.S.F. = \sqrt[3]{\frac{8}{27}} = \frac{2}{3}$	<p>B1</p>	

	$\frac{2}{3} = \frac{1.8m}{\text{height of larger tank}}$ $\text{Height of the larger tank} = \frac{3}{2} \times 1.8m = 2.7m$	M1 A1	
		3 MARKS	
6.	$2 \times \text{Radius} = \frac{6.4\sqrt{3}}{\sin 60^\circ}$ $= 6.4\sqrt{3} \div \frac{\sqrt{3}}{2}$ $= 6.4\sqrt{3} \times \frac{2}{\sqrt{3}} \times \frac{1}{2}$ $= 6.4cm \quad \text{Radius}$	M1 A1	for use of $\frac{\sqrt{3}}{2}$
		2 MARKS	
7.	$DB = \sqrt{156^2 - 144^2} = 60m$ $\text{Area of } \triangle DBC = \frac{1}{2} \times 144 \times 60 = 4\,320m^2$ $\text{for } \triangle ADB, S = \frac{60 + 60 + 70}{2} = 95$ $\text{Area of } \triangle ADB = \sqrt{95(95 - 60)(95 - 60)(95 - 70)}$ $= \sqrt{2\,909\,375} = 1\,705.69m^2$ $\text{Area of Kerubo's farm} = 4\,320m^2 + 1\,705.69m^2$ $= 6\,025.69m^2$ $= 0.60 \text{ hectares}$	M1 A1 M1 A1	C.A.O.
		4 MARKS	
8.	<p>a) <math>OQ = OP + PQ</math></p> $= \begin{pmatrix} 1 \\ -3 \end{pmatrix} + \begin{pmatrix} 4 \\ -2 \end{pmatrix} = \begin{pmatrix} 5 \\ -5 \end{pmatrix}$ $Q(5, -5)$ $ PQ  = \sqrt{(4)^2 + (-2)^2}$ $= \sqrt{20}$ $= 2\sqrt{5} \text{ units}$ <p>b)</p>	M1 A1 M1 A1	
		4 MARKS	

9.	$6a^2 - ab - b^2 = 6a^2 - 3ab + 2ab - b^2$ $= 3a(2a - b) + b(2a - b)$ $(3a + b)(2a - b)$ $2b^2 + ab - 2a^2 - 4ab$ $= b(2b + a) - 2a(a + 2b)$ $(b - 2a)(2b + a)$ $\frac{(3a + b)(2a - b)}{(b - 2a)(2b + a)} \div \frac{2(3a + b)}{a}$ $= \frac{-1(3a + b)}{(2b + a)} \times \frac{a}{2(3a + b)}$ $= \frac{-a}{2b + a}$	<p>M1</p> <p>M1</p> <p>A1</p> <p>3 MARKS</p>	
10.	$t^2 = \frac{6}{0.4567}$ $= \frac{6}{4.567}$ $= 60 \times 0.2190$ $t^2 = 13.14$ $t = \sqrt{13.14}$ $= 3.6249$	<p>M1</p> <p>A1</p> <p>B1</p> <p>3 MARKS</p>	<p>Evidence of use of tables</p> <p>C.A.O.</p>
11.	$\text{Selling price} = \frac{97.5}{100} \times Ks\text{ } 4\,800\,000 = Ks\text{ } 4\,680\,000$ $Ks\text{ } 70\,200 = R\% \times Ks\text{ } 4\,680\,000$ $\text{Rate of commission} = \frac{100 \times Ks\text{ } 70\,200}{4\,680\,000}$ $= 1.5\% \text{ of salaes}$	<p>M1</p> <p>M1</p> <p>A1</p> <p>3 MARKS</p>	

12.		<p>B1</p> <p>B1</p> <p>B1</p>	
		3 MARKS	
13.	<p>a) Distance <math>\sqrt{4.5^2 + 8^2 - (2 \times 4.5 \times 8 \times \cos 105^\circ)}</math>  <math>= 10.1\text{km}</math></p> <p>b) <math>\frac{10.1}{\sin 105^\circ} = \frac{4.5}{\sin \theta}</math>  <math>\sin \theta = \frac{4.5 \times \sin 105^\circ}{10.1}</math>  <math>\theta = \sin^{-1} 0.42853</math>  <math>25.37^\circ</math>          Bearing <math>= 30^\circ - 25.37^\circ = 4.63^\circ</math>  <math>= 005^\circ</math></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>4 MARKS</p>	<p>C.A.O.</p> <p>C.A.O.</p>
14.	$k \begin{pmatrix} 2 \\ -2 \end{pmatrix} + h \begin{pmatrix} 2 \\ 3 \end{pmatrix} = \begin{pmatrix} 2 \\ -7 \end{pmatrix}$ $\begin{aligned} 2k + 2h &= 2 \\ -2k + 3h &= -7 \end{aligned} \quad +$ $\begin{aligned} 5h &= -5 \\ h &= -1 \\ k &= 2 \end{aligned}$	<p>M1</p> <p>M1</p> <p>A1</p> <p>3 MARKS</p>	<p>Formation of 2 equations  <i>✓ attempt to solve</i></p> <p>For both</p>

15.	$1155 = \frac{1}{3} \times \frac{22}{7} \times r^2 \times 10$ $r^2 = 110.25$ $r = 10.5\text{cm}$ $\text{Slant height of cone} = \sqrt{10.5^2 + 10^2}$ $= 14.5\text{cm}$ $\text{Area of curved surface} = \frac{22}{7} \times 10.5 \times 14.5$ $= 478.5\text{cm}^2$	M1 A1  M1 A1 3 MARKS	
16.	$1440^\circ = (n - 2)180^\circ$ $n = 10$ $\text{Ext. angle} = \frac{360^\circ}{10} = 36^\circ \quad \}$ $\text{Int. angle} \quad \{ 180^\circ - 36^\circ = 144^\circ$ $\frac{\text{Ext. angle}}{\text{Int. angle}} = \frac{36^\circ}{144^\circ} \times 100$ $= 25\%$	M1 A1  B1  3 MARKS	For both
17.	$y = \frac{1}{2}x + 5$ <p>Gradient of L = <math>\frac{1}{2}</math></p> <p>a) <math>\frac{-3+2k}{3k-3} = \frac{1}{2}</math></p> $-6+4k=3k-3$ <p>b) <math>k=3</math></p> <p>c) <math>m_2 = -2</math></p> $\frac{y+3}{x-9} = -2$ $y+3 = -2x+18$ $y = -2x+15$ $\frac{y+6}{0-3} = \frac{1}{2}$ $2y+12 = -3$ <p>d) <math>2y = -15</math></p> <p>e) <math>t = -7.5</math></p> <p>y - intercep</p> $\text{Tan}\theta = 0.5$ $\theta = \text{Tan}^{-1}0.5$ $= 26.57^\circ$ $\text{Obtuse angle} = 153.43^\circ$	B1 M1 A1  M1  A1 M1  A1 B1	

18.	<p>a) (i) <math>X - \text{sectional area} = \frac{1}{2} \times 4\text{cm} \times 4\text{cm} \times \sin 60^\circ</math>  <math>= 6.9282\text{cm}^2</math>  <math>\text{Volume of prism} = 6.9282\text{cm}^2 \times 6\text{cm}</math>  <math>= 41.6\text{cm}^3</math></p> <p>(ii) <math>CF = \sqrt{6^2 + 4^2}</math>  <math>= 7.2\text{cm}</math></p> <p>b) (i) No. of lines of symmetry = 10  (ii) Order of rotational symmetry = 3 c)</p> 	M1  M1 A1 M1 A1 B1 B1  B 1 B 1 B 1	
		10 MARKS	

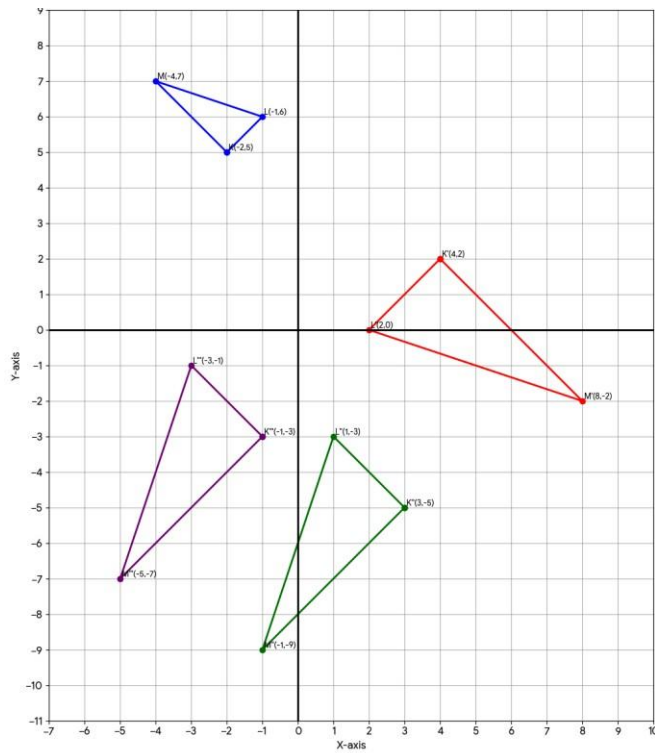
19.	<p>a) Ballast: Sand: Cement  2 : 1  9 : 5  18 : 9 : 5</p> <p><math>\text{Mass of cement} = \frac{5}{18 + 9 + 5} \times 14\,400\text{kg}</math>  <math>= 2\,250\text{kg}</math>  <math>\text{No. of bags of cement} = \frac{2\,250\text{kg}}{50\text{kg}}</math>  <math>= 45 \text{ bags}</math>  <math>\text{Cost of cement needed} = 45 \times \text{Ksh. } 960</math>  <math>= \text{Ksh. } 43\,200</math></p> <p>b)</p>	M1 A1  M1  A1 M1  M1 A1  M1 A1	
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	<p>c) New cost of a bag of cement <math>\frac{93.75}{100} \times 960</math>  <math>=</math> <math>= Ksh. 900</math>  <math>New\ no.\ of\ bags = \frac{Ksh.\ 43\ 200}{Ksh.\ 900}</math>  <math>= 48\ bags</math>  <math>= 3\ more\ bags</math></p>	10 MARKS	
20.	<p>a) Distance from B = <math>156km - (\frac{45}{60} hrs \times \frac{48km}{h})</math></p> <p>b)</p> <p>Time taken for car to reach C = <math>\frac{36km}{24km}</math></p> <p>(ii) Distance between towns B and C  <math>72km</math>  <math>= 120km</math></p> <p>(i) Relative speed = <math>\frac{72km}{h} - \frac{48km}{h} = \frac{24km}{h}</math></p> <p><math>\frac{48km}{48km/h} = 1\ hour</math></p> <p>c) Time taken = <math>1\frac{1}{2}\ hours</math>          by truck to reach B = <math>Arrival\ time = 8:20am + 1\frac{1}{2}hour</math>  <math>= 9:50am</math>  <math>= 156km - (1\frac{1}{2}hour \times \frac{48km}{h})</math> by car to reach B = <math>= 48km</math>  <math>1hr - (12 + 9)minutes</math>  <math>= 39minutes</math>  <math>Speed\ of\ car = \frac{48km}{60\ hrs}</math>  <math>= 73.85km</math></p>	<p>M1 A1</p> <p>M1</p> <p>M1 A1</p> <p>M1 A1</p> <p>M1 M1 A1</p>	
		10 MARKS	

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21.	<p>a) <math>6 + 14 + 4n + 14 + 2(2n - 1) + 10 + 6 + 4 = 100</math>  <math>54 = 8n - 2 = 100</math>  <math>= 6</math></p> <p>b) <math>n</math>  <i>modal class</i> = <math>4(6) = 24</math></p> <p>c) (i) C.fs <math>\rightarrow 6, 20, 44, 58, 80, 96, 100, 100</math>  <i>Median</i> = <math>44.5 + \left(\frac{2 - 44}{14}\right) \times 10</math>  <math>= 44.5 + 4.2857</math>  <math>= 48.49\text{cm}</math> (ii)</p> <p style="text-align: center;"><i>Mean height</i> = <math>\frac{5010}{100}</math>  <math>= 50.1\text{cm}</math></p>	<p>M1</p> <p>A1 B1 B1</p> <p>M1</p> <p>A1</p> <p>B1</p> <p>B1</p> <p>M1 A1</p>	<p>x column fx column</p>
		10 MARKS	

22.



B1  
B1

$\Delta KLM$   
 $\Delta K'L'M'$

a)



Height (cm)	x	f	fx
15 – 24	19.5	6	117
25 – 34	29.5	14	413
35 – 44	39.5	24	948
45 – 54	49.5	14	693
55 – 64	59.5	22	1309
65 – 74	69.5	10	695
75 – 84	79.5	6	477
85 – 94	89.5	4	358
		$\Sigma f = 10$	$\Sigma fx = 5010$

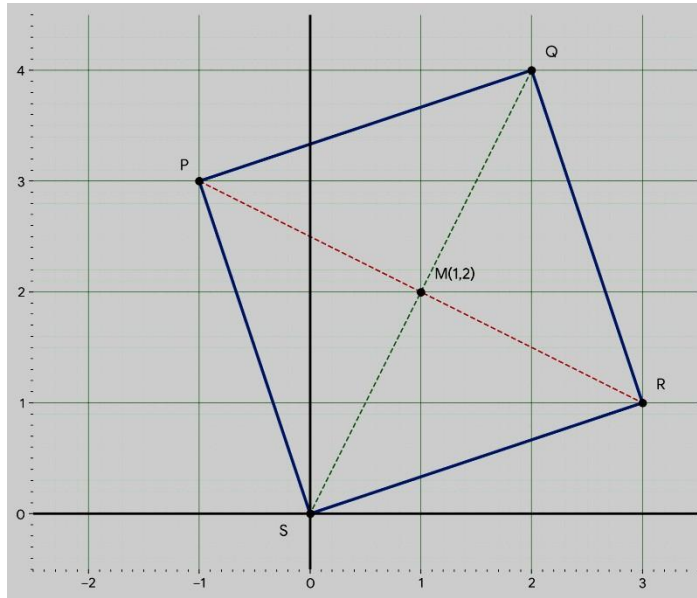
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	b) <i>centre of enlargement</i> (0, 4) <i>s. f of enlargement</i> = -2 c) $K''(3, -5)L''(1, -3)M''(-1, -9)$ d) $K''(-1, -3)L''(-3, -1)M''(-5, -7)$	B	Evidence of rotation $\Delta K''L''M''$ coordinates Evidence of $\Delta K'''L'''M'''$ translation coordinates
		1	
B			
1			
B			
1			
B			
1			
B1			
B1			
		10 MARKS	

<p>23.</p>	<p style="text-align: right;"><math>-(6 \times 5) = -38</math></p> <p>a) <math>Det = (4 \times -2) - (6 \times 5) = -38</math></p> <p><math>A^{-1} = -\frac{1}{38} \begin{pmatrix} -2 &amp; 5 \\ 3 &amp; -2 \end{pmatrix}</math></p> <p><math>= \begin{pmatrix} \frac{1}{19} &amp; \frac{5}{38} \\ \frac{3}{19} &amp; \frac{-2}{19} \end{pmatrix}</math></p> <p>b) (i) <math>4 + 5a = 440</math> <math>\left. \begin{matrix} p \\ - \\ = 140 \end{matrix} \right\}</math></p> <p><math>\begin{pmatrix} 1 &amp; 5 \\ -2 &amp; a \end{pmatrix} \begin{pmatrix} p \\ 60 \end{pmatrix} = \begin{pmatrix} 440 \\ 280 \end{pmatrix}</math></p> <p><math>\begin{pmatrix} 1 &amp; 0 \\ 0 &amp; 1 \end{pmatrix} \begin{pmatrix} p \\ a \end{pmatrix} = \begin{pmatrix} 60 \\ 40 \end{pmatrix}</math></p> <p><i>le costs Ksh. 60</i></p> <p><math>2t - \frac{2}{3}(8 - t) = 0</math></p> <p><math>2t - \frac{16}{3} + \frac{2}{3}t = 0</math></p> <p>c) <math>\frac{8t}{3} = \frac{16}{3}</math></p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>B1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>M1</p>	<p>accept</p> <p><math>\begin{pmatrix} 4 &amp; 5 \\ 6 &amp; -2 \end{pmatrix} \begin{pmatrix} p \\ a \end{pmatrix} = \begin{pmatrix} 440 \\ 280 \end{pmatrix}</math></p>
	<p><math>\frac{3}{3} = \frac{3}{3}</math></p> <p><math>t = 2</math></p>	<p>10 MARKS</p>	

24.



a)



B1

 Location of S  
at  
(0,0)

B1

 Completed  
rhombus  
PQRS

B1

B1

B1

M1

 Diagonals PR  
and QS drawn

A1

M1

M1

A1

b)

 $M(1, 2)$ 

c)

$$\text{gradient} = \frac{4-0}{2-0} = 2$$

$$\frac{y-4}{x-2} = 2$$

$$y-4 = 2(x-2)$$

$$y-2x = 2$$

	<p>d)</p> <p style="text-align: center;"><i>rea o r om us</i></p> $ QS  = \sqrt{4^2 + 2^2} = \sqrt{20} \text{ units}$ <p style="text-align: center;">A      f h      b      PQRS = <math>\frac{1}{2} \times \sqrt{20} \times \sqrt{20}</math></p>		
		10 MARKS	

