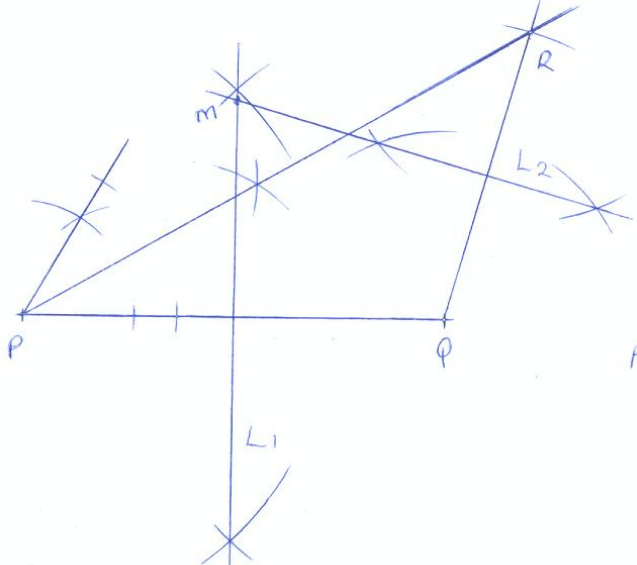
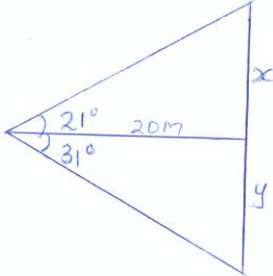


END OF TERM II EXAMINATION MARKING SCHEME

No	WORKING	MARKS									
1.	$\sqrt{6.458 \times 10^{-2} + 2 \left(\frac{1}{0.4327} \right)^2}$ $2.541 + (2.311)^2$ $\hookrightarrow 2.541 + 2(5.307)$ $\hookrightarrow 2.541 + 10.61$ $\hookrightarrow 13.155$	M1 M1 A1									
2.	Mid-point = $\left(\frac{3+7}{2}, \frac{9+5}{2} \right) = (5, 7)$ Gradient = $\frac{5-9}{7-3} = -1$ $m_2 = 1$ $\frac{y-7}{x-5} = 1 \implies 1(x-5) = y-7$ $-x + y + 2 = 0$	B1 M1 A1									
3.	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>Men</td> <td>hours</td> <td>days</td> </tr> <tr> <td>40</td> <td>10</td> <td>8</td> </tr> <tr> <td>60</td> <td>8</td> <td>?</td> </tr> </table> $\frac{40}{60} \times \frac{10}{8} \times 8$ $\hookrightarrow 6\frac{1}{3}$	Men	hours	days	40	10	8	60	8	?	B1 M1 A1
Men	hours	days									
40	10	8									
60	8	?									
4.	Volume of cylinder = $\frac{22}{7} \times 7 \times 7 \times 5 = 770 \text{ cm}^2$ Volume of sphere = $\frac{4}{3} \times \frac{22}{7} \times r^3 = 770$ $r^3 = 770 \times \frac{3}{4} \times \frac{7}{22}$ $r^3 = 183.75 \quad r = \sqrt[3]{183.75} = 5.69 \text{ cm}$	M1 M1 A1									
5.	$5000 \times 72.23 = \text{sh. } 361150$	M1									

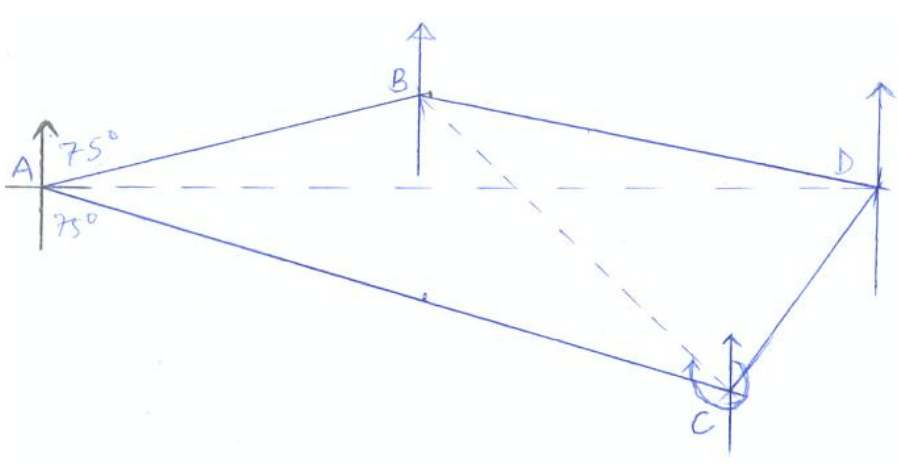
	$\text{Sh. } 361\,150 - 214\,500 = \text{Sh. } 146\,650$ $\frac{146\,650}{135.97}$ $\text{£ } 1078.55$	M1 A1
6.	$2^2 \times 2^{2n} + 2^{2n} \times 2^1 = 384$ Let $2^{2n} = y$ $4y + 2y = 384$ $6y = 384$ $y = 64$ $2^{2n} = 64 \quad 2^{2n} = 2^6$ $2n = 6 \quad n = 3$	M1 M1 A1
7.	$(x - 50) + (2x + 20) = 180^\circ$ $3x = 210$ $x = 70^\circ$ Exterior angle = $70 - 50 = 20^\circ$ $\text{Number of sides} = \frac{360}{20} = 18 \text{ sides}$	 M1 M1 A1
8.	$3x - 30 + 7x + 50 = 90^\circ$ $10x + 20 = 90^\circ$ $10x = 90^\circ - 20^\circ = 70^\circ$ $x = \frac{70}{10} = 7^\circ$	M1 A1
9.	$4 = \frac{x - 30}{5}$ $x = 50 \text{ m/s}$ $\text{Distance} = \frac{1}{2} \times 5 \times (50 + 30) + (10 \times 50) + \frac{1}{2} \times 5 \times 50$ $\text{£ } 825 \text{ m}$	M1 A1 M1 A1

10.	 B_1 for L_1 B_1 for L_2 B_1 for Δ $PM = 5 \text{ cm. } B_1$	
11.	$L.S.F^2 = A.S.F$ $L.S.F = \sqrt{\frac{50}{162}} = \sqrt{\frac{25}{81}} = \frac{5}{9}$ $V.S.F = \left(\frac{5}{9}\right)^3$ $\frac{x}{36450} = \left(\frac{5}{9}\right)^3$ $x = \frac{36450 \times 5^3}{9^3} = 6250$ $\text{Half full} = \frac{6250}{2} = 3125 m^3$	M1 M1 B1 A1
12.	$1 - 2x < 5$ $-2x < 4$ $x > -2$ $5 - 3x > -10$ $-3x > -15$ $x < 5$ $-2 < x < 5$	B1 B1 B1

13.	 $\tan 21^\circ = \frac{x}{20} \Rightarrow x = 20 \tan 21^\circ = 7.677$$\tan 31^\circ = \frac{y}{20} \Rightarrow y = 20 \tan 31^\circ = 12.02$$\text{Height} = 20 \tan 21^\circ + 20 \tan 31^\circ = 19.69\text{ m}$	M1 M1 A1																												
14.	$\sqrt{4x^6 \times y^2 \times z^2}$$= 2x^3 y z$	B1 B1																												
15.	$3i - 2j + k$$OP = \begin{pmatrix} 3 \\ -2 \\ 1 \end{pmatrix} \quad OQ = \begin{pmatrix} 2 \\ 1 \\ -3 \end{pmatrix}$$PQ = \begin{pmatrix} 2-3 \\ 1-(-2) \\ -3-1 \end{pmatrix} = \begin{pmatrix} -1 \\ 3 \\ -4 \end{pmatrix}$$PQ = \sqrt{(-1)^2 + (3)^2 + (-4)^2}$$= \sqrt{26}$$\therefore 5.099\text{ units} = 5.10\text{ units}$	M1 M1 A1																												
16.	<table><tr><th>Height</th><th>x</th><th>F</th><th>F x</th></tr><tr><td>$h \leq 4$</td><td>2</td><td>4</td><td>8</td></tr><tr><td>$h \leq 8$</td><td>6</td><td>11</td><td>66</td></tr><tr><td>$h \leq 12$</td><td>10</td><td>16</td><td>160</td></tr><tr><td>$h \leq 16$</td><td>14</td><td>13</td><td>182</td></tr><tr><td>$h \leq 20$</td><td>18</td><td>6</td><td>108</td></tr><tr><td></td><td></td><td>50</td><td>524</td></tr></table>$\dot{x} = \frac{524}{50}$$\therefore 10.48$	Height	x	F	F x	$h \leq 4$	2	4	8	$h \leq 8$	6	11	66	$h \leq 12$	10	16	160	$h \leq 16$	14	13	182	$h \leq 20$	18	6	108			50	524	B1 x and F B1 F x M1 A1
Height	x	F	F x																											
$h \leq 4$	2	4	8																											
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$h \leq 20$	18	6	108																											
		50	524																											
17.	a) (i) $\frac{100 \times 4800}{88}$	M1 M1 A1																												

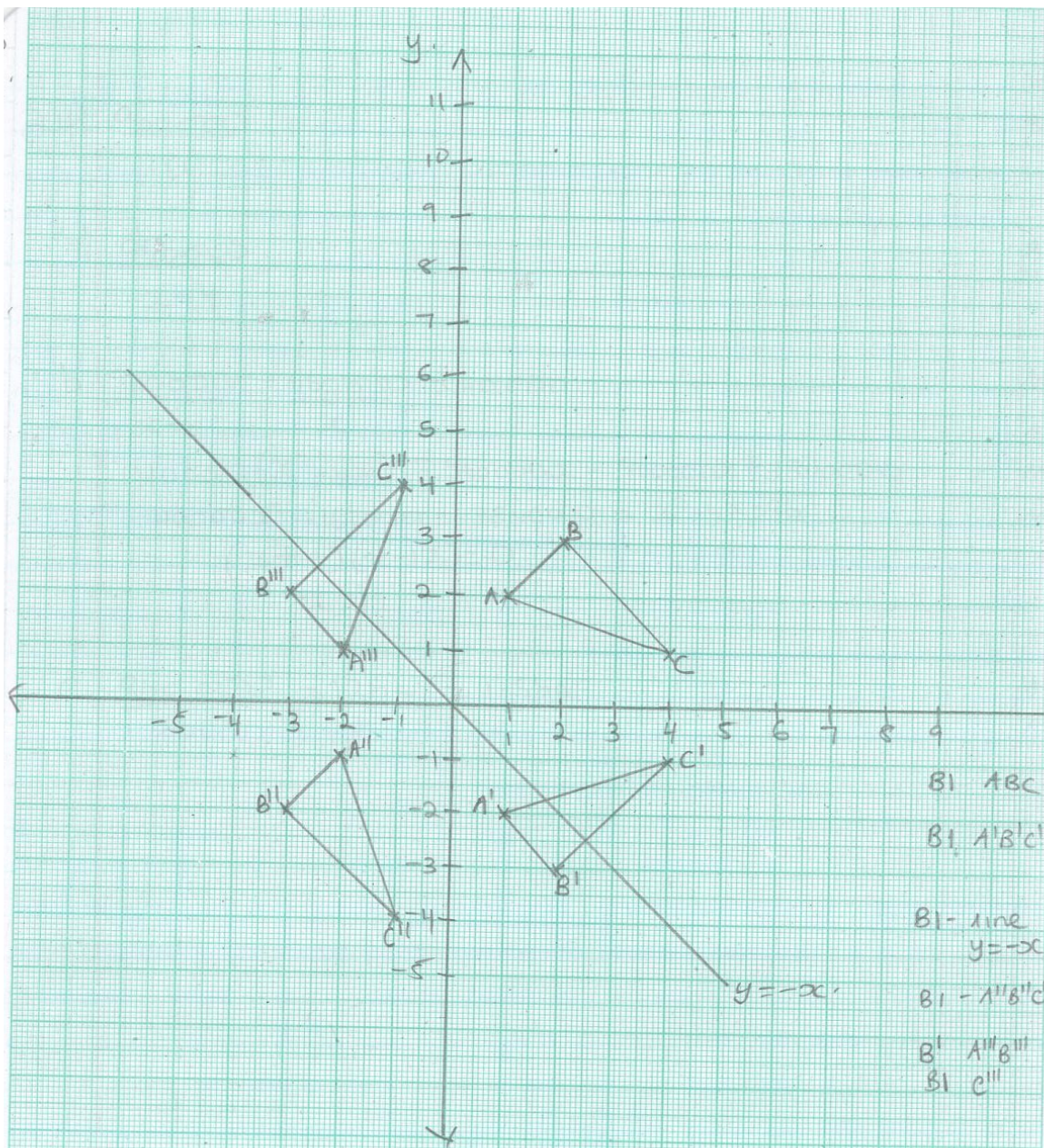
	$\text{sh. } 5454.55$ (ii) $145\% = 4800$ $100\% = ?$ $\frac{100 \times 4800}{145} = \text{shs. } 3310.34$ b) $\frac{5454.55 \times 100}{3310.34}$ $\text{sh. } 164.77\%$ c) $\frac{87.5 \times 3310.34}{100}$ $\text{sh. } 2896.55$	M1 A1 M1M1 A1 M1 A1
18.	a) $\frac{x}{x+4} = \frac{3.5}{4.9}$ $4.9x = 3.5x + 14$ $x = 10$ Height of cone = $10 + 4 = 14 \text{ cm}$ b) Area of hemisphere $2\pi r^2$ $= \frac{22}{7} \times 2 \times 4.9^2 = 150.92 \text{ cm}^2$ Frustum $\left(2 \times \frac{22}{7} \times 4.9 \times \sqrt{4.9^2 + 14^2}\right) - \left(2 \times \frac{22}{7} \times 3.5 \times \sqrt{10^2 + 3.5^2}\right)$ $456.76 - 232.98 = 223.78 \text{ cm}^2$ $223.78 + 150.92 = 374.7 \text{ cm}^2$ c) Volume of hemisphere $= \frac{1}{2} \times \frac{22}{7} \times \frac{4}{3} \times 4.9^3 = 246.502$ $\frac{1}{3} \times \frac{22}{7} \times 4.9 \times 14 - \frac{1}{3} \times \frac{22}{7} \times 3.5 \times 10$ $71.87 - 36.67 = 35.1967$ $35.1967 + 246.502 = 281.6987$	M1 A1 M1 M1 A1 M1 M1 M1 A1
19.	a) Gradient PQ = $\frac{3-3}{1-6} = \frac{6}{7}$	M1

	$\frac{6}{7} = \frac{y-3}{x-1}$ $7y - 21 = 6x - 6$ $7y - 6x = 15$ b) $\frac{y+3}{x-2} = \frac{6}{7}$ $7y + 21 = 6x - 12$ $7y = 6x - 12 - 21$ $y = \frac{6}{7}x - \frac{33}{7}$ c) $L_3 \Rightarrow \frac{-7}{6} = \frac{y-3}{x-2}$ $6y - 18 = -17x + 14$ $6y = -17x + 14 + 18$ $6y + 7x = 32$ d) $7y - 6x = 15$ $6y + 17x = 32$ $\begin{pmatrix} 7 & -6 \\ 6 & 7 \end{pmatrix} \begin{pmatrix} y \\ x \end{pmatrix} = \begin{pmatrix} 15 \\ 32 \end{pmatrix}$ $\frac{1}{85} \begin{pmatrix} 7 & 6 \\ -6 & 7 \end{pmatrix} \begin{pmatrix} 7 & -6 \\ 6 & 7 \end{pmatrix} \begin{pmatrix} y \\ x \end{pmatrix} = \frac{1}{85} \begin{pmatrix} 7 & 6 \\ -6 & 7 \end{pmatrix} \begin{pmatrix} 15 \\ 32 \end{pmatrix}$ $\begin{pmatrix} y \\ x \end{pmatrix} = \frac{1}{85} \begin{pmatrix} 297 \\ 134 \end{pmatrix}$ $y = 3.49 \quad x = 1.58$	A1 M1 A1 M1 A1 M1 M1 A1 both values
20.	a) (i) $a:b:c$ $(3:4) \times 1$ $(1:2) \times 4$ $3:4:8$ (ii) $\frac{3}{15} \times 20$  4 litres	A1 M1 A1 M1 A1

	b) (i) $\frac{3}{15} \times 80 + \frac{4}{15} \times 84 + \frac{8}{15} \times 90 = sh. 86.40$ (ii) Selling price = $\frac{125}{100} \times 86.40 = shs. 108$ c) Rate of P and Q $\frac{1}{7} \times 14\,000 + \frac{1}{5} \times 12\,000 = 4400/hr$ Time taken $\frac{550\,000}{4400} = 125\text{ hours}$	M1 A1 M1 M1 A1
21.	 i. $AC = 9.2 \times 50 = 460\text{ km} (\pm 5\text{ km})$ ii. $312^\circ (\pm 1^\circ)$ iii. $AD = 10.8 \times 50 = 540\text{ km} (\pm 5\text{ km})$ iv. $230^\circ (\pm 1^\circ)$	B1 B1 B1 B1 B1 B1 B1 B1 B1
22.	a) Time difference = 1 hour 15 minutes Distance = $80 \times \frac{5}{4} = 100\text{ km}$ b) Remaining distance = $(550 - 100) = 450\text{ km at } 10:00\text{ a.m.}$ Relative speed = $100 + 80 = 180\text{ km/hr}$ Time taken = $\frac{D}{S} = \frac{450}{180} = 2.5\text{ hours}$ $\frac{5}{2} \times 80 = 200 + 100 = 300\text{ km}$ c) $10:00\text{ a.m.} + 2:30 = 12:30\text{ p.m.}$ d) Total time = $\frac{550}{100} = 5\text{ hrs } 30\text{ mins}$	M1 A1 M1 M1 A1 M1 A1 M1 M1 A1

	10:00a.m. + 5 hrs 30 mins = 3:30 p.m.	
23.	On the graph.	
24	a) (i) $\frac{960\,000}{x}$ (ii) $\frac{960\,000}{x-4}$ b) $\frac{960\,000}{x-4} - \frac{960\,000}{x} = 40\,000$ $40\,000(x^2 - 4x) = 960\,000x - 960\,000x + 3\,840\,000$ $40\,000x^2 - 160\,000x = 3\,840\,000 \implies x^2 - 4x - 96 = 0$ $(x+8)(x-12) = 0$ $x = 12$ c) $\frac{960\,000}{80\,000} = \frac{12}{8}$ $\hookrightarrow 1.5\,ha$	B1 B1 M1 M1 M1 M1 A1 M1 M1 A1

23.



b) Reflection on line $y=0$ or x -axis $B1 \triangle B1$

e) $\begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{pmatrix} 1 & 2 & 4 \\ 2 & 3 & 1 \end{pmatrix} = \begin{pmatrix} -2 & -3 & -1 \\ 1 & 2 & 4 \end{pmatrix} \quad M1$

$\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \quad A1$