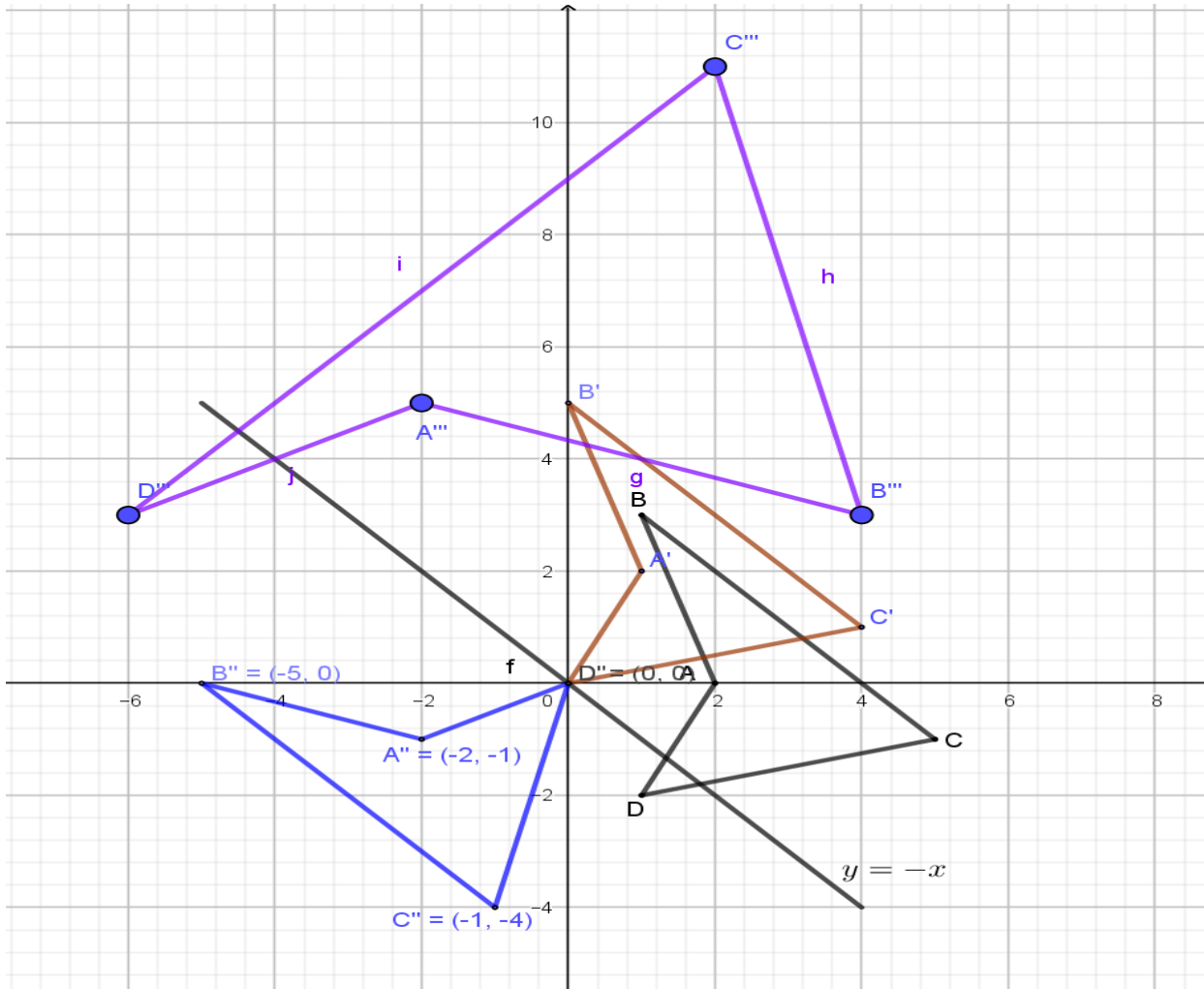


MARKING SCHEME

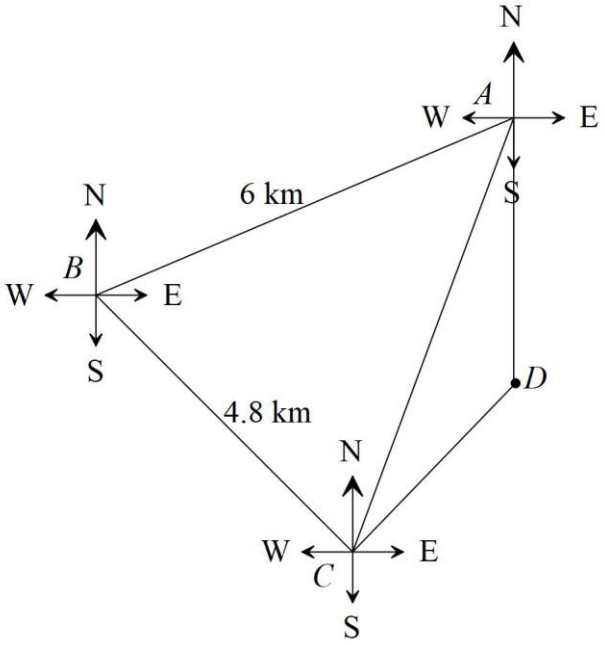
No	Working	Marks
1	$N \Rightarrow \frac{2}{3} + \frac{5}{6} - \frac{5}{4} = \frac{3}{12}$ $D \Rightarrow \frac{2}{3} \times \frac{9}{4} - \frac{8}{7} = \frac{3}{2} - \frac{8}{7} = \frac{5}{4}$ $\frac{N}{D} = \frac{3}{12} \div \frac{5}{14} = \frac{7}{10}$	M1 M1 A1
2	$3(3 + \sqrt{7}) - \sqrt{7}(3 + \sqrt{3}) = 2$ $\frac{2}{3 - \sqrt{7}} - \frac{2}{3 + \sqrt{7}} = \frac{2(3 + \sqrt{7}) - 2(3 - \sqrt{7})}{2}$ $= \frac{4\sqrt{7}}{2} = 2\sqrt{7}$	M1 M1 A1
3	$2^x \times 3^y = 4 \times 27$ $2^x = 2^2 \Rightarrow x = 2$ $3^y = 3^3 \Rightarrow y = 3$	M1 M1 A1
4	<p>Area of rhombus = $2 \times 0.5 \times 9 \times 9 \times \sin 60 = 70.14 \text{ cm}^2$</p> <p>Area of sector = $\frac{60}{360} \times \frac{22}{7} \times 81 = 42.43 \text{ cm}^2$</p> <p>Area of shaded region = $70.14 - 42.43 = 27.71 \text{ cm}^2$</p>	M1 M1 A1
5	<p>(a) $4680 \times 182.13 = \text{Sh. } 852\,368.40$</p> <p>(b) Balance = $852368.40 - 51790.40 = \text{Sh. } 800578$</p> <p>Amount in dollars = $\frac{800\,578}{147.36} = 5432.8 \cong 5432 \text{ dollars}$</p>	M1 A1 M1 A1
6	<p>Total time = $30 \text{ mins} + 2 \text{ hrs} + 4 \text{ hrs} = 6 \text{ hr } 30 \text{ min}$</p> <p>Arrival time = $10:00 \text{ a.m.} + 6 \text{ hr } 30 \text{ min} = 4:30 \text{ p.m.}$</p>	M1 A1
7	<p>HPP = $6000 + (1500 \times 24) = \text{Sh. } 42\,000$</p> <p>Carrying charge = $42\,000 - 35\,000 = \text{Sh. } 7\,000$</p>	M1 M1 A1
8	<p>(a) $3 - 2x < x - 3$ and $x - 3 \leq 4$</p> <p>(b) $6 < 3x \Rightarrow x > 2$</p> <p style="padding-left: 2em;">$x \leq 4 + 3 \Rightarrow x \leq 7$</p> <p>(c) integral values = $3, 4, 5, 6$ and 7</p>	B1 B1 B1 B1
9	$m_1 = \frac{8 - 6}{4 - 2} = 1$ $m_2 = -1$ <p>Mid point of AB = $\frac{2+4}{2}, \frac{6+8}{2} = 3, 7$</p> $\frac{y - 7}{x - 3} = -1$ $y = -x + 10$	M1 M1 A1

10	$\frac{(2n)90}{(2n-4)90} = \frac{4}{3}$ $6n = 8n - 16$ $n = 8$ $\text{Sum} = (2(8) - 4)90 = 1080^\circ$	M1 M1 A1
11	$\log_5 5 + \log_5 x = \log_5 12$ $5x = 12$ $x = \frac{12}{5} = 2.4$	M1 M1 A1
12	$15^2 = 9^2 + r^2$ $r = \sqrt{144} = 12 \text{ cm}$ $\text{Volume of cone} = \frac{1}{3} \times \frac{22}{7} \times 12 \times 12 \times 9 = 1357.71 \text{ cm}^2$	M1 M1 A1
13	$r = 12.181818 \dots \dots \text{ (i)}$ $100r = 1218.181818 \dots \dots \text{ (ii)}$ $99r = 1206$ $r = \frac{1206}{99} = 12 \frac{2}{11}$	M1 M1 A1
14	$\tan 28.5 = \frac{h}{8+x} \Rightarrow h = (x+8) \tan 28.5$ $\tan 37.2 = \frac{h}{x} \Rightarrow h = x \cdot \tan 37.2$ $(x+8) \tan 28.5 = x \cdot \tan 37.2$ $x = 20.11 \text{ m}$ $h = 20.11 \times 0.7590 = 15.3 \text{ m}$	M1 M1 A1
15	$\text{Actual volume} = \frac{22}{7} \times 4.2 \times 4.2 \times 12 = 665.28 \text{ cm}^2$ $\text{Maximum volume} = \frac{22}{7} \times 4.25 \times 4.25 \times 12 = 681.21 \text{ cm}^2$ $\text{Minimum volume} = \frac{22}{7} \times 4.15 \times 4.15 \times 12 = 649.53 \text{ cm}^2$ $\text{Percentage error} = \frac{15.84}{665.28} \times 100 = 2.38\%$	M1 M1 A1
16	$3x^2 - x - 7 = 0$ $x = \frac{-(-1) \pm \sqrt{1 - (4 \times 3 \times -7)}}{2(3)}$	M1 M1

	$x = \frac{1 + 9.220}{6} \text{ or } x = \frac{1 - 9.220}{6}$ $x = 1.703 \text{ or } -1.37$	A1
17	<p>(a) $\angle a = 43^\circ$ (subtended by chord AB) $\angle b = 40^\circ$ $\angle c = 25^\circ$ (subtended by chord DC) $\angle e = 180 - 40 + 25 + 43 + 40 = 32^\circ$</p> <p>(b) $180^\circ - 80^\circ = 100^\circ$ $2x = 100^\circ$ $x = 50^\circ$</p> <p>$y + 70 = 180^\circ$ $y = 110^\circ$</p> <p>(c) $\angle x = 360^\circ - 138^\circ = \frac{222}{2}$ $= 111^\circ$</p>	B1 B1 B1 B1 B1 B1 B1 B1 B1 B1
18	<p>(i) $9^2 + 10^2 - 2(9)(10) \cos \theta = 12^2$</p> <p>Hence $\cos \theta = \frac{37}{180}$</p> <p>$\theta = 78.18$</p> <p>(ii)</p> <p>$\frac{12}{\sin 78.14} = \frac{9}{\sin \theta}$</p> <p>Hence $\beta = 47.22$</p> <p>(iii)</p> <p>$\frac{12}{\sin 78.14} = 2r$ hence radius = 6.13</p> <p>Area = $\left(\frac{22}{7} \times 6.13^2\right) - \left(\frac{1}{2} \times 9 \times 10 \times \sin 78.14\right)$</p> <p>= 74.059 cm^2</p>	M1 M1 A1 M1 M1 A1 B1 M1M1 A1
19		

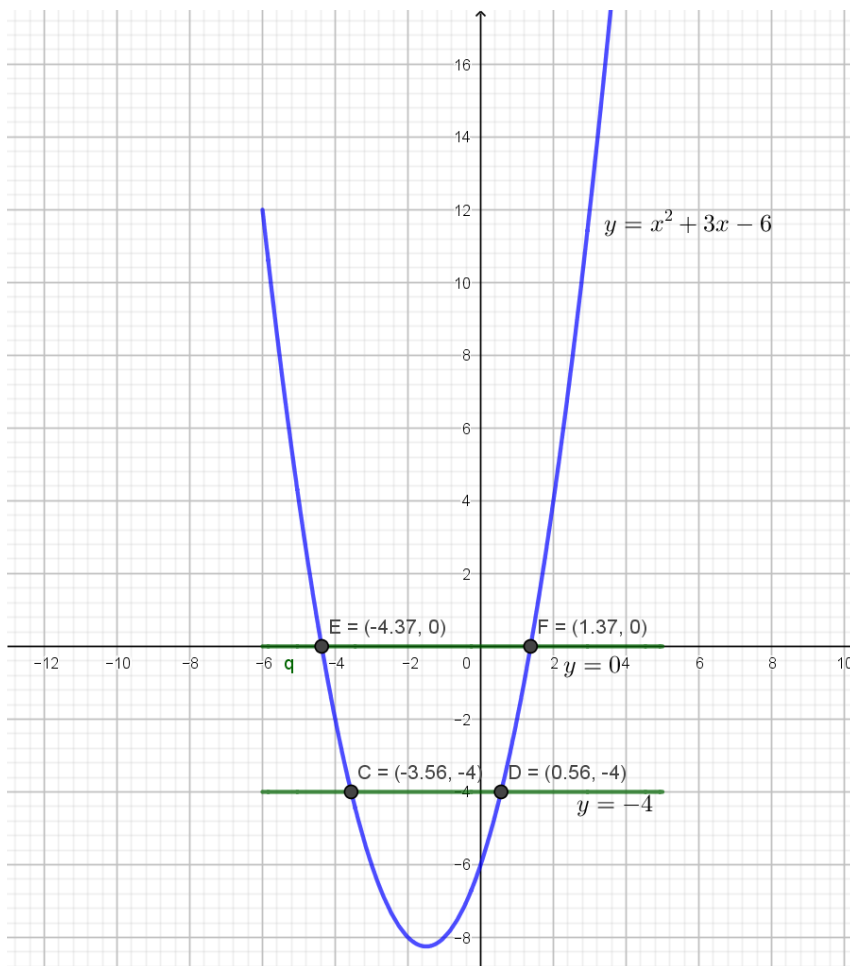


20	<p>(a) (i) $\frac{21}{14} = \frac{22.5+x}{x}$ $21x - 14x = 315$ $x = 45 \text{ cm}$</p> <p>(ii) Volume = $\frac{1}{3} \times \frac{22}{7} \times 21 \times 21 \times 67.5 = 31185 \text{ cm}^3$</p> <p>(iii) Volume = $\frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times 45 = 9240 \text{ cm}^3$</p> <p>(iv) Volume = $31185 - 9240 = 21945 \text{ cm}^3$</p> <p>(b) Mass = $\frac{3 \times 21\,945}{1000} = 65.835 \text{ kg}$</p> <p>(c) Volume of cube = $\frac{80 \times 21\,945}{100} = 17\,556 \text{ cm}^3$ Length of cube = $\sqrt[3]{17\,556} = 26 \text{ cm}$</p>	<p>M1</p> <p>M1</p> <p>M1</p> <p>M1 A1</p> <p>M1 A1</p> <p>M1</p> <p>M1 A1</p>
21	(a)	

	 <p>(b) (i) 20.3° (ii) 3.1 km (iii) 5.52 km</p>	Every point 1 mark B2 B2 B2																														
22	<p>(a) $15\ 100 = (0.03 \times 100\ 000) + (0.05 \times k)$ $15\ 100 - 3000 = 0.05k$ $k = \frac{12\ 100}{0.05} = 242\ 000$ Total sales = $100\ 000 + 242\ 000$</p> <p>(b) S.P = 955 000 M.P = $\frac{100}{95.5} \times 955\ 000 = 1\ 000\ 000$ B.P = $\frac{11}{116} \times 100\ 000 = 862\ 100$ Profit = $1\ 000\ 000 - 862\ 100 = Sh. 137\ 900$</p> <p>(c) Total profit = $(52000 - 35000) + (58000 - 55000)$ = $17000 + 3000$ = $Sh. 20\ 000$</p>	M1 M1 A1 M1 M1 M1 A1 M1 M1 A1																														
23	<p>(a)</p> <table border="1"> <thead> <tr> <th>Class</th> <th>Tally</th> <th>f</th> <th>x</th> <th>fx</th> <th>$c.f$</th> </tr> </thead> <tbody> <tr> <td>40 – 43</td> <td>###</td> <td>5</td> <td>41.5</td> <td>207.5</td> <td>5</td> </tr> <tr> <td>44 – 47</td> <td>////</td> <td>4</td> <td>45.5</td> <td>182</td> <td>9</td> </tr> <tr> <td>48 – 51</td> <td>###/</td> <td>6</td> <td>49.5</td> <td>297</td> <td>15</td> </tr> <tr> <td>52 – 55</td> <td>//</td> <td>2</td> <td>53.5</td> <td>107</td> <td>17</td> </tr> </tbody> </table>	Class	Tally	f	x	fx	$c.f$	40 – 43	###	5	41.5	207.5	5	44 – 47	////	4	45.5	182	9	48 – 51	###/	6	49.5	297	15	52 – 55	//	2	53.5	107	17	B2
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		56 – 59	###/	6	57.5	345	23							
		60 – 63	//	2	61.5	123	25							
	(b)	$\bar{x} = \frac{1261.5}{25} = 50.46 \text{ kg}$							M1M1A1					
	(c)	Median = $47.5 + \left(\frac{12.5-9}{6}\right) \times 4$ = $47.5 + 2.3$ = 49.8 kg							M1 M1 A1					
	(d)	Modal frequency = 6 Modal class = 56 – 59// 48 – 51							B1 B1					
24	(a)													
		x	-6	-5	-4	-3	-2	-1	0	1	2	3	4	
		y	12	4	-2	-6	-8	-8	-6	-2	4	12	22	B2

(b)



(c) (i) values of $x = -4.4$ and 1.4 B2

(ii) Graph of $y = -4$ is drawn B2

Values of $x = -3.6$ and 0.6 B1