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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	Area of rhombus $= 2 \times 0.5 \times 9 \times 9 \times \sin 60 = 70.14\ cm^2$ Area of sector $= \frac{60}{360}\times\frac{22}{7}\times 81 = 42.43\ cm^2$ Area of shaded region $= 70.14 - 42.43 = 27.71\ cm^2$	M1 M1 A1
5	(a) $4680 \times 182.13 = Sh.\,852\,368.40$ (b) Balance $= 852368.40 - 51790.40 = Sh.\,800578$ Amount in dollars $= \frac{800\,578}{147.36} = 5432.8 \cong 5432\ dollars$	M1 A1 M1 A1
6	Total time = 30 mins + 2 hrs + 4 hrs = $6\ hr\ 30\ min$ Arrival time = $10{:}00\ a.m = 6\ hr\ 30\ min = 4{:}30\ p.m$	M1 A1
7	HPP = $6000 + (1500 \times 24) = Sh.\,42\,000$ Carrying charge = $42\,000 - 35\,000 = Sh.\,7\,000$	M1 M1 A1
8	(a) $3 - 2x < x - 3$ and $x - 3 \leq 4$ $(b)\ 6 < 3x \Rightarrow x > 2$ $x \leq 4 + 3 \Rightarrow x \leq 7$ (c) integral values = 3,4,5,6 *and* 7	B1 B1 B1 B1
9	$m_1 = \frac{8-6}{4-2} = 1$ $m_2 = -1$ Mid point of AB = $\frac{2+4}{2}, \frac{6+8}{2} = 3,7$ $\frac{y-7}{x-3} = -1$ $y = -x + 10$	M1 M1 A1

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

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	$x = \frac{1 + 9.220}{6}$ or $x = \frac{1 - 9.220}{6}$ $x = 1.703$ or -1.37	 A1
17	(a) $< a = 43^0$ (subtended by chordAB) $< b = 40^0$ $< c = 25^0$ (subtended by chord DC) $< e = 180 - 40 + 25 + 43 + 40 = 32°$ (b) $180° - 80° = 100°$ $2x = 100°$ $x = 50^0$ $y + 70 = 180^0$ $y = 110^0$ (c) $\angle x = 360° - 138° = \frac{222}{2}$ $= 111^0$	B1 B1 B1 B1 B1 B1 B1 B1 B1 B1
18	(i) $9^2 + 10^2 - 2(9)(10)\cos\theta = 12^2$ $Hence\ \cos\theta = \frac{37}{180}$ $\theta = 78.18$ (ii) $\frac{12}{\sin 78.14} = \frac{9}{\sin\theta}$ $Hence\ \beta = 47.22$ (iii) $\frac{12}{\sin 78.14} = 2r\ hence\ radius\ = 6.13$ $Area = \left(\frac{22}{7} \times 6.13^2\right) - \left(\frac{1}{2} \times 9 \times 10 \times \sin 78.14\right)$ $= 74.059\ cm^2$	M1 M1 A1 M1 M1 A1 B1 M1M1 A1
19		

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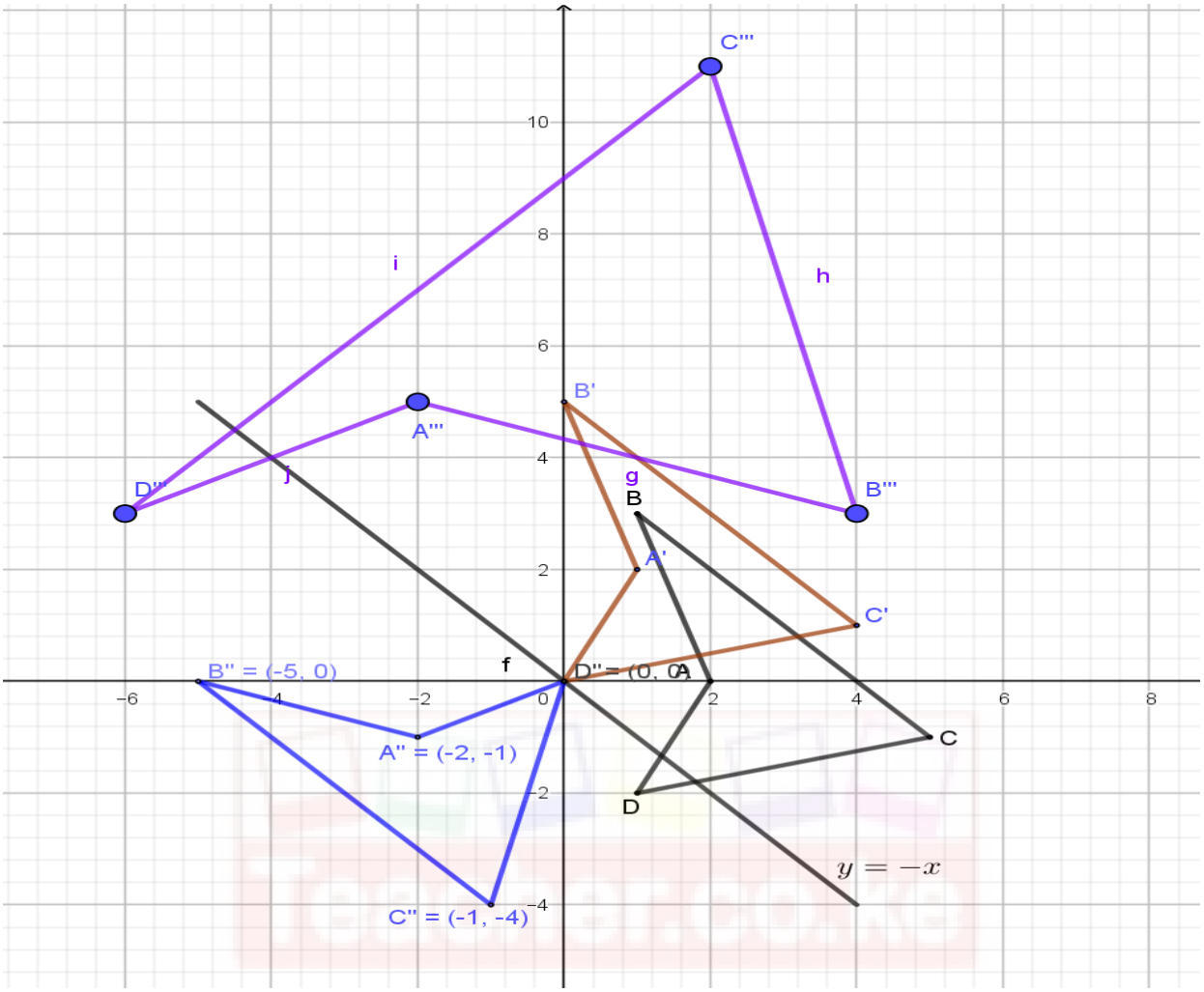

20	(a) (i) $\frac{21}{14} = \frac{22.5+x}{x}$ $21x - 14x = 315$ $x = 45\ cm$ (ii) Volume = $\frac{1}{3} \times \frac{22}{7} \times 21 \times 21 \times 67.5 = 31185\ cm^3$ (iii) Volume = $\frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times 45 = 9240\ cm^3$ (iv) Volume = $31185 - 9240 = 21945\ cm^3$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

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	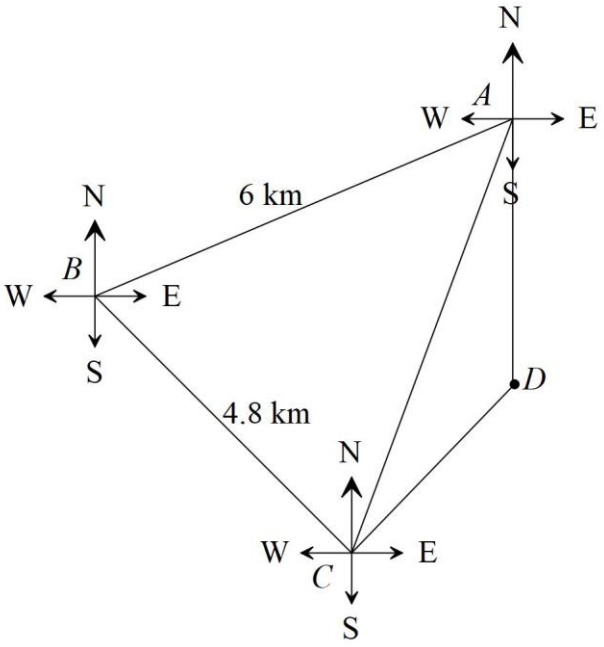 (b) (i) 20.3° (ii) 3.1 km (iii) 5.52 km	Every point 1 mark B2 B2 B2
22	(a) $15\ 100 = (0.03 \times 100\ 000) + (0.05 \times k)$ $15\ 100 - 3000 = 0.05k$ $k = \frac{12\ 100}{0.05} = 242\ 000$ Total sales = $100\ 000 + 242\ 000$ (b) S.P = 955 000 M.P = $\frac{100}{95.5} \times 955\ 000 = 1\ 000\ 000$ B.P = $\frac{11}{116} \times 100\ 000 = 862\ 100$ Profit $= 1\ 000\ 000 - 862\ 100 = Sh.\ 137\ 900$ (c) Total profit = $(52000 - 35000) + (58000 - 55000)$ $= 17000 + 3000$ $= Sh.\ 20\ 000$	M1 M1 A1 M1 M1 M1 A1 M1 M1 A1
23	(a)	B2

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

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	$56-59$	/// /	6	57.5	345	23	
	$60-63$	//	2	61.5	123	25	

(b) $\bar{x} = \frac{1261.5}{25} = 50.46\ kg$ M1M1A1

(c) Median $= 47.5 + \left(\frac{12.5-9}{6}\right) \times 4$ M1

$= 47.5 + 2.3$ M1

$= 49.8\ kg$ A1

(d) Modal frequency = 6 B1

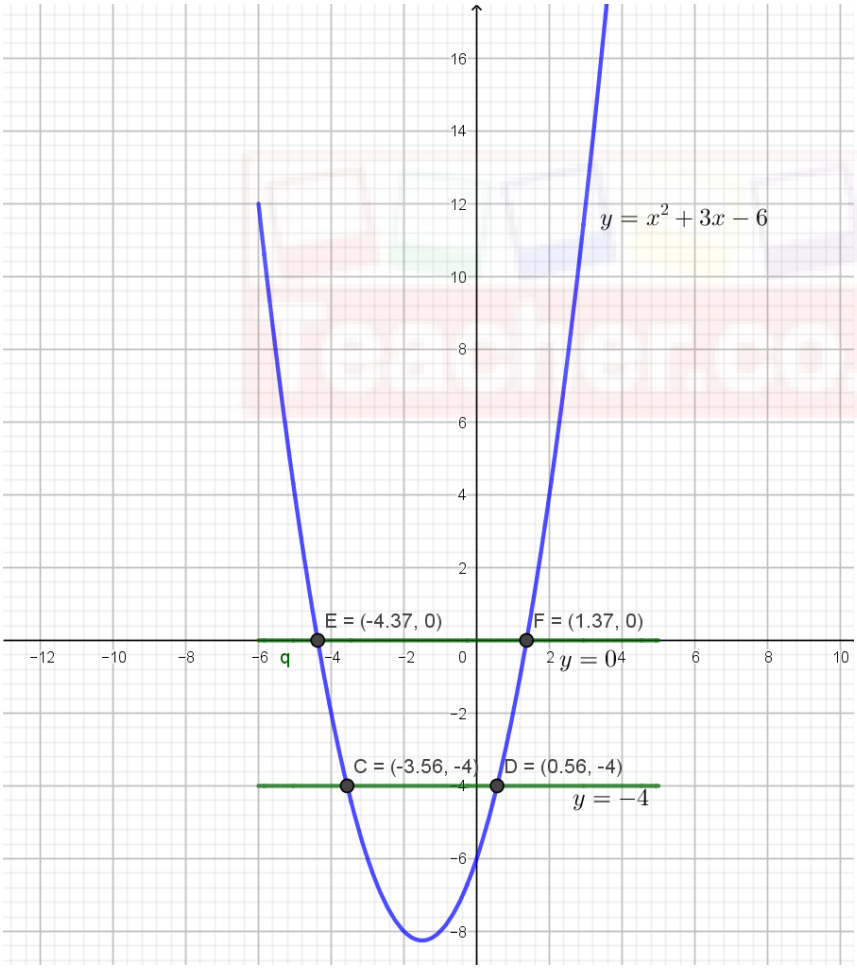
Modal class = $56-59 // 48-51$ B1

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

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Values of $x = -3.6$ and 0.6 B1

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