Terminal Unit Higher Tier Section A

1(a)	12.5%	W3	M1 1800÷1600 or 200÷1600 M1 1.125 or 0.125 or 1.13 or 0.13 or 1/8 or 1 1/8 or 112 1/2% A1 12.5 or 13 dept on M1
(b)	£1125	W3 {6}	M1 1800÷8 M1 225 A1 1125
2	-13.5	W3 {3}	M1 ($x - 6 =$)$3x + 21$ M1 $x - 3x = 21 + 6$ or ft from $x - 6 = 3x + 7$ or e.g. $x - 6 = 3x - 21$ A1 -13.5
3	$\frac{\pi ab^2}{6}$ Explanation dimensions L^3 so volume	M1 A1 {2}	condone omission 6 must include multiplication
4(a)	$20x - 8y = 52$ $27x = 54$ (dept. on 1st M1) $x = 2$, $y = -1.5$ or $-3/2$	M1 M1 A1	M1 Sub $x = \frac{13 + 2y}{5}$ M1 $7(13+2y)+4y = 10$ or better W1 $x = 2$, $y = -1.5$ only
(b)(i)	$(x - 2)(x - 5)$	W2	W1 $(x \pm 2)(x \pm 5)$
(ii)	2 and 5	W1 {6}	ft from factors
5(a)	$x \times x = x^2$ or $3 \times 2x = 6x$ Completion	M1 A1	
(b)	7 55	W1 W1	
(c)	5 points plotted correctly Smooth curve drawn	P1 C1	ft table, allow ±1mm in plots
(d)	3.6 to 3.7	W1 {7}	or ft their curve

6(a)(i)	Tree diagram correct	W2	M1 0.3 seen for 1st ball red
(ii)	0.42	W3	W2 for 0.21(accept t/d) Or M2 $2 \times 0.7 \times 0.3$ (or 1- 0.58) Or M1 0.7×0.3 s.o.i. SC1 $0.7 \times 0.7 + 0.3 \times 0.3$
(b)(i)	p^2	W1	
(ii)	40	W2 {8}	M1 0.8 for prob. blue A1 40 (ft (i) for M1 and A1)
7	NT ..$7^0 = 1$ (from alg. indices or 2 num.examples) ST 1/n is <0 when n is negative or with 2 examples (1 n pos, 1 n neg)	W2 W2 {4}	M1 7^0 seen from add'n indices or W1 for NT with 1 supporting example M1 1/n seen or n^{-1} If 0 scored then Sc1 for NT **and** ST
8	$\frac{t - c^2}{2} = d$ or eq	W3 {3}	M1 $c^2 = t - 2d$ M1 $c^2 - t = -2d$ (allow $\sqrt{c - t} = -2d$ from $\sqrt{c} = t - 2d$ for 2nd M1) A1 $\frac{t - c^2}{2} = d$ or eq.
9(a)(i)	½	W1	
(ii)	$\sqrt{3}/2$	W2	M1 $2^2 = 1^2 + h^2$ A1 $\sqrt{3}/2$
(b)	P and R e.g. RHS In P with evidence (cos 60 = 8/hyp so) hyp= 16 or in R with evidence (cos x =8/16 so $x = 60^0$	M1 M1 A1 {6}	M1 and A1 are dependent on 1st M1 x must be shown on diagram
10(a)	$y = 2x^3$ sketched	W1	
(b)	$y = (x - 2)^3$ sketched	W1 {2}	
11(a)	$3\sqrt{2}$	W1	
(b)	$9 - 6\sqrt{2}$	W2 {3}	M1 $\sqrt{9} + \sqrt{36} - \sqrt{18} - \sqrt{18}$ (accept $\sqrt{(3 \times 6)}$ or $\sqrt{3}\sqrt{6}$ for $\sqrt{18}$) A1 $9 - 6\sqrt{2}$ or $9 - 2\sqrt{18}$

Terminal Unit Higher Tier Section B

12(a)	7.59	W2	W1 7.591.... or 7.592
(b)	4.41×10^{-6}	W2 {4}	W1 figs 441 or 4.4×10^{-6}
13(a)	41 45 45(.3) 45	W2	M1 for (34+52+37)/3 or W1 for 1 correct ww
(b)	e.g.Large increase at 'start' then stays about the same	W1 {3}	
14(a)	14 and 4 seen $\sqrt{(14^2+4^2)}$ 14.5 to 14.6	W1 M1 A1	 or $\sqrt{(7^2+2^2)}$ or their 14,4 or 7.2 to 7.3
(b)(i)	3.5 or 7/2	W2	M1 $\frac{\text{their } 14}{\text{their } 4}$
(ii)	$y = 3.5x - 4$	W2 {7}	M1 $y = 3.5x + c$ or $y = mx - 4$ or $3.5x - 4$ ft their gradient for M1 or W2
15	46 or 46.0	W4 {4}	W3 for 46.03.... M1 tan 17.5 = BM/146 or M2 BM = tan 17.5 ×146 A2 46 or 46.0 Or A1 46.03... After A0 allow W1 for ans. To 2/3 sig. fig. if trig used Grads 41.1 to 41.2 scores A1 Sine rule M1 $\frac{BM}{\sin 17.5} = \frac{146}{\sin \angle AMB}$ or M2 BM = $\frac{146 \sin 17.5}{\sin 72.5}$
16(a)	P = 870	W1	
(b)	818 to 819	W2	M1 t =3 substituted SC1 If t=1 used in (a) then SC1 for 802 to 803
(c)	Decreasing 2%	M1 A1√ {5}	goes down condone 51 in 3 years, ft

17(a)	66 <QPR = 66 isos triangle <QRT = <QPR alternate segment	W1 W1 W1	 accept 2 sides/angles equal alt. method W1<PRS =48 alt.segment W1 <QRP = 66 isos. triangle
(b)	5.9...	W2 {5}	M1 ½ ×4×4×sin48 Or M1 ½ ×3.2...×3.6 to 3.7 A1 5.76 to 6.0...
18(a)	1.25 hours or 1hr 15 mins or 75 minutes	W3	Or W2 omission units M1 15/20 Or M2 0.75, 0.5
(b)(i)	$12/x + 25/(x+4)$	W1	isw (condone 60 used)
(ii)	$12(x+4) + 25x = 2x(x+4)$ $12x + 48 + 25x = 2x^2 + 8x$ $2x^2 - 29x - 48 = 0$	M1 M1 A1	(condone 60 used)
(iii)	16 (condone -1.5)	W3 {10}	M1 sub in formula or $(x \pm 16)(2x \pm 3)$ Or M2 (29±35)/4 or $(x - 16)(2x + 3)$ (Accept √ 1225 for 35)
19	41.4... or 41 318.6 or 318.5... or 319	W1 W1 {2}	grad 46 or 454 for W1
20	49.8...	W4 {4}	M1 27, 15, 3 condone 1 error M1 15, 37.5, 52.5, 75, 105 used condone 2 error M1 4185/84 (their 4185 using 3 correct midpoints or endpoints) A1 49.8 to 50
21(a)	$r^3 = 15000/4\pi$ $r = \sqrt[3]{1193(.6..)}$	M1 A1	M1 only for substitution unless 10.7 also tested
(b)	423 to 424.4	W4 {6}	M1 $\pi 10.6^2$ or 352 to 353.5... **And** M2 $4\pi 10.6^2/20$ or 70.5..to 70.7.. or 71 or M1 $4\pi 10.6^2$ or 1411 to 1414. ... A1 423 -424.4