

1	$\frac{6}{11}$	3 [3]	M2: $\frac{54}{99}$ or $\frac{18}{33}$ or $99N = 54$ M1: $100(N) = 54.5454(\dots)$
2	$\sqrt{100} + 2\sqrt{20} + \frac{1}{2}\pi\frac{20}{4} [\frac{1}{2}\pi(\sqrt{5})^2]$ allow $\sqrt{5} \times 2\sqrt{5}$ for $\sqrt{100}, \sqrt{5 \times 20}$ , o.e.	3 [3]	1 for each term seen If 0 then M1 for $\sqrt{20} = 2\sqrt{5}$ , $\frac{\sqrt{20}}{2} = \sqrt{5}$ , $r = \sqrt{5}$ . NB: 2 marks for: $(\sqrt{5} + 2)\sqrt{20} = (\dots)\sqrt{4}\sqrt{5} = (\dots)2\sqrt{5} = 10 + 4\sqrt{5}$
3(a)	Correct histogram (0.3, 4.45, 4.9, 3.9, 0.67)	2	M1: at least three blocks correct. Tol = 1mm vertically.
(b)	Range the same More tall students play b-b o.e.	1 1 [4]	Modal heights the same, comparison of one group, etc. Must be comparison.
4	$x^2 + (x - 2)^2 = 100$ $x^2 + x^2 - 4x + 4 = 100$ $(x - 8)(x + 6)$ (8, 6) and (-6, -8)	M1 A1 +M1 A1+1 [5]	or equiv in y W2: $x^2 - 4x + 4$ , $2x^2 - 4x - 96$ , $x^2 - 2x - 48$ f.t factors of their quadratic if possible A1 for x or y values or W1 for "both their y = their x - 2" If 0 or 1 <sup>st</sup> M1 so far then answers from no (or wrong) algebra score s.c. 1 + 1 or 1 for x(y) - values only, or 1 for "both their y = their x - 2"
5(a)	Basic sine shape 2 complete sine cycles of period 180 1 (or -1) marked on y-axis	1 1 1	at least half-cycle with start at (0, 0) and curve reaches $\pm 1$
(b)	75 or 195 or 255 or any correct	1 [4]	
6(a)	Translation down	1	
(b)	$\begin{pmatrix} 4 \\ 0 \end{pmatrix}$	2 [3]	Translation of 4 to the right. M1: translation or "4 to the right"
7	$\frac{6x - x - 2}{(x + 2)3x}$ correctly obtained	3 [3]	M2: $\frac{2 \times 3x - (x + 2)}{(x + 2)3x}$ , or with 6x, acc in 2 parts M1: den correct from LHS or num seen and correct. $(6x - x + 2)/\text{denom}$ is M1 only