23		$d = -2$		6	M1 for common difference
		$(S_n =)\frac{n}{2}\left[2(177)+(n-1)(-2)\right]$ or $(S_n =)\frac{n}{2}\left[354-2n+2\right]$ or $(S_n =)\frac{n}{2}\left[356-2n\right]$ oe			M1 for correctly substituting 177 and –2 into $(S_n =)\frac{n}{2}\left[2a+(n-1)d\right]$
		$\frac{n}{2}\left[2(177)+(n-1)(-2)\right]=(n-2)\times 180$			M1 dep on M2 for equating S_n with $(n-2)\times 180$
		E.g. $2n^2+4n-720=0$ or $n^2+2n-360=0$ oe Allow $n^2+2n=360$			A1 (dep on M3) writing a correct 3-term quadratic expression in form $ax^2 + bx + c$ (= 0) allow $ax^2 + bx = c$
		E.g. $(x-18)(x+20)(=0)$ $x = \frac{-2\pm\sqrt{2^2-4\times1\times-360}}{2}$ e.g. $(x+1)^2-(1)^2=360$			M1 (dep on M2) for a complete method to solve their 3-term quadratic equation Allow one sign error and some simplification – allow as far as $\frac{-2\pm\sqrt{4+1440}}{2}$
			18		A1 dep on M3 for 18 only
					Total 6 marks

23 ALT		3, 5, 7,… **and** $d = 2$ or $a = 3$ **and** $d = 2$		6	M1 for identifying exterior angle sequence for at least 3 terms and $d = 2$ **or** first term and common difference
		$(S_n =)\frac{n}{2}\left[2(3)+(n-1)(2)\right]$ or $(S_n =)\frac{n}{2}\left[6+2n-2\right]$ or $(S_n =)\frac{n}{2}\left[4+2n\right]$ oe			M1 for correctly substituting 3 and 2 into $(S_n =)\frac{n}{2}\left[2a+(n-1)d\right]$
		$\frac{n}{2}\left[2(3)+(n-1)(2)\right]=360$			M1 dep on M2 for equating S_n with 360
		E.g. $2n^2+4n-720=0$ or $n^2+2n-360=0$ oe Allow $n^2+2n=360$			A1 (dep on M3) writing a correct 3-term quadratic expression in form $ax^2 + bx + c$ (= 0) allow $ax^2 + bx = c$
		E.g. $(x-18)(x+20)(=0)$ $x = \frac{-2\pm\sqrt{2^2-4\times1\times-360}}{2}$ e.g. $(x+1)^2-(1)^2=360$			M1 (dep on M2) for a complete method to solve their 3-term quadratic equation Allow one sign error and some simplification – allow as far as $\frac{-2\pm\sqrt{4+1440}}{2}$
			18		A1 dep on M3 for 18 only
					Total 6 marks