QUESTION 2/*VRAAG* 2

2.1.1	$r = \frac{1}{2}$ Yes, because $-1 < \frac{1}{2} < 1$	✓ $r = \frac{1}{2}$ ✓ answer with reason (2)
2.1.2	$S_\infty = \frac{a}{1-r}$ $S_\infty = \frac{4}{1-\frac{1}{2}}$ $\therefore S_\infty = 8$	✓ substitution ✓ answer (2)
2.2	$\sum_{p=k}^{10} 3^{p-1} = 3^{k-1} + 3^{k+1-1} + 3^{k+2-1} + ... + 3^9$ $= 3^{k-1} + 3^k + 3^{k+1} + ... 3^9$ $S_n = \frac{a(r^n - 1)}{r-1}$ $29\,520 = \frac{3^{k-1}(3^{11-k} - 1)}{3-1}$ $3^{10} - 3^{k-1} = 59\,040$ $3^{k-1} = 9$ $k - 1 = 2$ $\therefore k = 3$	✓ $a = 3^{k-1}$ ✓ $r = 3$ ✓ $n = 11 - k$ ✓ substitution ✓ answer (5)
		[9]

QUESTION 3/*VRAAG* 3

3.1.1	3 ; 7 ; 12 ; 18 $\vee$ $\vee$ $\vee$ First diff: 4 ; 5 ; 6 $\vee$ $\vee$ Second diff: 1 ; 1 $2a=1$ $a=\frac{1}{2}$ $3a+b=4$ $3\left(\frac{1}{2}\right)+b=4$ $b=\frac{5}{2}$ $a+b+c=3$ $\frac{1}{2}+\frac{5}{2}+c=3$ $c=0$ $T_n=\frac{1}{2}n^2+\frac{5}{2}n$	✓ $2a=1$ ✓ $3\left(\frac{1}{2}\right)+b=4$ ✓ $\frac{1}{2}+\frac{5}{2}+c=3$ (3)
3.1.2	$13\,527=\frac{1}{2}n^2+\frac{5}{2}n$ $n^2+5n-27\,054=0$ $(n-162)(n+167)=0$ $n=162$ or $n=-167$ $T_{161}=13\,363$ $\therefore T_{161}+164=13\,527$ 164 must be added. **OR/*OF*** $T_n=3+$ sum of 1st differences $13527=3+4+5+...+n$ $\frac{n-3+1}{2}[3+n]=13527$ $n^2+n-27\,060=0$ $(n+165)(n-167)=0$ n = 164	✓ $13\,527=\frac{1}{2}n^2+\frac{5}{2}n$ ✓ standard form ✓ answers for n ✓ 164 (4) **OR/OF** ✓ $13527=3+4+5+...+n$ ✓ $n^2+n-27\,060=0$ ✓ answers for n ✓ 164 (4)

3.2.1	$T_n = 8 + (n-1)(3)$ $T_n = 3n + 5$ $41 = 3n + 5$ $36 = 3n$ $n = 12$	✓ $T_n = 3n + 5$ ✓ $T_n = 41$ ✓ answer (3)
3.2.2a	$P_{41} = 12$	✓ answer (1)
3.2.2b	$P_8 = a + 7d = 1$ $P_{11} = a + 10d = 2$ $3d = 1$ $d = \frac{1}{3}$ $a + 7\left(\frac{1}{3}\right) = 1$ $a = -\frac{4}{3}$	✓ $a + 7d = 1$ ✓ $a + 10d = 2$ ✓ value of d ✓ value of a (4)
		[15]