Section 1: Definitions and notation

Solutions to Exercise level 2

1. (i) Terms are of the form $2k$.
The last term is the 10^{th} term.
The series can be written as $\sum_{1}^{10} 2k$.

(ii) Terms are of the form k^2.
The last term is the 12^{th} term.
The series can be written as $\sum_{1}^{12} k^2$.

(iii) Terms are of the form $\frac{1}{k}$.
The last term is the 20^{th} term.
The series can be written as $\sum_{1}^{20} \frac{1}{k}$.

(iv) Terms are of the form $(-2)^{k-1}$.
The last term is the 7^{th} term.
The series can be written as $\sum_{1}^{7} (-2)^{k-1}$.

2. (i) $\sum_{1}^{5} (2k+1) = 3+5+7+9+11 = 35$

(ii) $\sum_{1}^{4} k^2 = 1+4+9+16 = 30$

(iii) $\sum_{0}^{4} 2^k = 1+2+4+8+16 = 31$

3. (i) $\sum_{1}^{6} (2k^2-1) = 1+7+17+31+49+71$
$= 176$

(ii) $\sum_{1}^{5} r^2 - \sum_{0}^{3} \frac{r}{r+1} = (1+4+9+16+25) - (0+\frac{1}{2}+\frac{2}{3}+\frac{3}{4})$
$= 53\frac{1}{12} = \frac{637}{12}$

Edexcel A level Maths Sequences 1 Exercise solutions

(iii) $\sum_{0}^{4}(2k+1)-\sum_{0}^{4}(2k-1)=(1+3+5+7+9)-(-1+3+5+7+9)$

$=10$

(iv) $\sum_{1}^{5}r^2+\sum_{1}^{5}(2r+1)=(1+4+9+16+25)+(3+5+7+9+11)$

$=90$

4. (iii) $\sum_{0}^{4}(2k+1)-\sum_{0}^{4}(2k-1)=\sum_{0}^{4}((2k+1)-(2k-1))$

$=\sum_{0}^{4}2$

$=2+2+2+2+2$

$=10$

(iv) $\sum_{1}^{5}r^2+\sum_{1}^{5}(2r+1)=\sum_{1}^{5}(r^2+2r+1)$

$=\sum_{1}^{5}(r+1)^2$

$=4+9+16+25+36$

$=90$