3.6) Sigma notation

Worked example	Your turn
Write out the terms in the series:	Write out the terms in the series:
$$\sum_{r=1}^{10}(3r+5)$$	$$\sum_{k=4}^{8}(2k+1)$$
	$9 + 11 + 13 + 15 + 17 = 65$
$$\sum_{n=7}^{13}(2-3n)$$	

Worked example	Your turn
Find the value of a, d and n: $$\sum_{r=1}^{10} (3r + 5)$$	Find the value of a, d and n: $$\sum_{k=4}^{8} (2k + 1)$$ $a = 9, d = 2, n = 5$
$$\sum_{n=7}^{13} (2 - 3n)$$	

Worked example	Your turn
Write in sigma notation: $8 + 13 + 18 + 23 + 28 + 33 + 38 + 43 + 48 + 53$ $-11 + -13 + -15 + -17 + -19 + -21 + -23$	Write in sigma notation: $6 + 7 + 8 + 9 + 10$ $\displaystyle\sum_{k=4}^{8}(k + 2)$

Worked example	Your turn
Write out the terms in the series:	Write out the terms in the series:

$$\sum_{r=1}^{10} 5 \times 3^{r-1}$$

$$\sum_{k=4}^{8} 3 \times 2^{k-1}$$

$$24 + 48 + 96 + 192 + 384 = 744$$

$$\sum_{n=7}^{13} 2 \times 5^{n-1}$$

Worked example	Your turn
Find the value of a, r and n:	Find the value of a, r and n:
$$\sum_{r=1}^{10} 5 \times 3^{r-1}$$	$$\sum_{k=4}^{8} 3 \times 2^{k-1}$$
	$a = 24, r = 2, n = 5$
$$\sum_{n=7}^{13} 2 \times 5^{n-1}$$	

Worked example

Your turn

Write in sigma notation:

$3 + 15 + 75 + 375 + 1875 + 9375 + 46875 + 234375 + 1171876 + 5859375$

$320 + 640 + 1280 + 2560 + 5120 + 10240 + 20480$

Write in sigma notation:

$54 + 162 + 486 + 1458 + 4374$

$$\sum_{k=4}^{8} 2 \times 3^{k-1}$$

Worked example	Your turn
Evaluate: $$\sum_{n=9}^{30}(2+7n)$$	Evaluate: $$\sum_{r=10}^{30}(7+2r)$$ 987

Worked example	Your turn
Given that $$\sum_{r=1}^{k} 3 \times 2^r = 12282$$ Find the value of k	Given that $$\sum_{r=1}^{k} 2 \times 3^r = 59046$$ Find the value of k $$k = 9$$

Worked example	Your turn
A convergent geometric series is given by $$1 + 2x + 4x^2 + 8x^3$$ a) Find the range of possible values of x b) Given that $$\sum_{r=1}^{\infty} (2x)^{r-1} = 2$$ find the value of x	A convergent geometric series is given by $$1 + 4x + 16x^2 + 64x^3$$ a) Find the range of possible values of x b) Given that $$\sum_{r=1}^{\infty} (4x)^{r-1} = 2$$ find the value of x a) $-\frac{1}{4} < x < \frac{1}{4}$ b) $x = \frac{1}{8}$