Problems for Gateway #1: Representing a Series Using Sigma Notation

1.   If the series: $1 + 2 + 4 + ... + 1024$ was written in summation notation, it would resemble

    (a) $\displaystyle\sum_{k=0}^{\infty} 2^k$ **(b)** $\displaystyle\sum_{k=0}^{10} 2k$

    (c) $\displaystyle\sum_{k=0}^{10} 2^k$ **(d)** $\displaystyle\sum_{k=1}^{10} 2^k$

2.   If the series: $1 + \dfrac{1}{2} + \dfrac{1}{3} + ... + \dfrac{1}{1324}$ was written in summation notation, it would resemble

    (a) $\displaystyle\sum_{k=1}^{1324} \frac{1}{k}$ **(b)** $\displaystyle\sum_{k=0}^{1324} \frac{1}{k}$

    (c) $\displaystyle\sum_{k=1}^{\infty} \frac{1}{k}$ **(d)** $\displaystyle\sum_{k=-1}^{1324} k^{-1}$

3.   If the series: $1 + \dfrac{1}{2} + \dfrac{1}{6} + \dfrac{1}{24} + \dfrac{1}{120} + ...$ was written in summation notation, it would resemble

    (a) $\displaystyle\sum_{k=1}^{120} \frac{1}{k}$ **(b)** $\displaystyle\sum_{k=1}^{60} \frac{1}{2k}$

    (c) $\displaystyle\sum_{k=0}^{20} \frac{1}{k \cdot 2^k}$ **(d)** $\displaystyle\sum_{k=1}^{\infty} \frac{1}{k!}$

4. If the series: $1 + 3 + 5 + 7 + ... + 1023$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=0}^{512}(2k-1)$　　　　　　　　　　　**(b)** $\displaystyle\sum_{k=0}^{10}2^{k}$

(c) $\displaystyle\sum_{k=0}^{511}(2k+1)$　　　　　　　　　　　**(d)** $\displaystyle\sum_{k=1}^{10}\left(2^{k}-1\right)$

5. If the series: $1 + \dfrac{1}{4} + \dfrac{1}{9} + \dfrac{1}{16} + \dfrac{1}{25} + ...$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=0}^{\infty}\frac{1}{k^{2}}$　　　　　　　　　　　**(b)** $\displaystyle\sum_{k=0}^{\infty}\frac{1}{(k+1)^{2}}$

(c) $\displaystyle\sum_{k=1}^{\infty}\frac{1}{2k-1}$　　　　　　　　　　　**(d)** $\displaystyle\sum_{k=1}^{5}\frac{1}{k^{2}}$

6. If the series: $1 + 4 + 9 + ... + 10000$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=1}^{100}k^{2}$　　　　　　　　　　　**(b)** $\displaystyle\sum_{k=0}^{10}k^{2}$

(c) $\displaystyle\sum_{k=0}^{10000}(2k+1)$　　　　　　　　　　　**(d)** $\displaystyle\sum_{k=1}^{100}3^{k}$

7. If the series: $1 + \dfrac{1}{2^{3}} + \dfrac{1}{3^{3}} + ... + \dfrac{1}{130^{3}}$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=1}^{130}\frac{1}{k^{3}}$　　　　　　　　　　　**(b)** $\displaystyle\sum_{k=0}^{130}\frac{1}{2^{k}}$

(c) $\displaystyle\sum_{k=0}^{130}\frac{1}{(2k+1)^{3}}$　　　　　　　　　　　**(d)** $\displaystyle\sum_{k=-130}^{-1}k^{-3}$

8. If the series: $\dfrac{1}{6} + \dfrac{1}{12} + \dfrac{1}{24} + \ldots$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=0}^{\infty}\dfrac{1}{6^k}$

(b) $\displaystyle\sum_{k=0}^{\infty}\dfrac{1}{12^k}$

(c) $\displaystyle\sum_{k=0}^{\infty}\dfrac{1}{6\cdot 2^k}$

(d) $\displaystyle\sum_{k=1}^{100}\dfrac{1}{6\cdot 2^k}$

9. If the series: $2 + 4 + 6 + 8 + \ldots + 1000$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=1}^{1000} 2\cdot k$

(b) $\displaystyle\sum_{k=1}^{500} 2^k$

(c) $\displaystyle\sum_{k=2}^{1000} (2k+2)$

(d) $\displaystyle\sum_{k=1}^{500} 2\cdot k$

10. If the series: $\dfrac{1}{4} + \dfrac{1}{9} + \dfrac{1}{16} + \dfrac{1}{25} + \ldots + \dfrac{1}{400}$ was written in summation notation, it would resemble

(a) $\displaystyle\sum_{k=4}^{400}\dfrac{1}{k^2}$

(b) $\displaystyle\sum_{k=2}^{20}\dfrac{1}{k^2}$

(c) $\displaystyle\sum_{k=0}^{20}\dfrac{1}{k^2}$

(d) $\displaystyle\sum_{k=0}^{400}\dfrac{1}{(k+2)^2}$

Answers

1.	C	2.	A	3.	D	4.	C	5.	B	6.	A
7.	A	8.	C	9.	D	10.	B				