Problems for Gateway #1: Distinguishing Finite and Infinite Series

1. Which of the following describes an infinite series?

(a) $1 + 2 + 3 + 4 + 5$

(b) $1 + 1.1 + 1.2 + 1.3 + 1.4 + ... + 2$

(c) $1 + 1.2 + 1.3 + 1.4 + ...$

(d) $1 + \frac{1}{1.1} + \frac{1}{1.2} + \frac{1}{1.3} + ... + \frac{1}{2}$

2. Which of the following describes an infinite series?

(a) $9 - 8 - 7 - 6 - ... - 2 - 1$

(b) $9 + 81 - 243 + ...$

(c) $9 + 9.9 + 9.99 + 9.999 + ... + 9.99999999$

(d) $9 + 90 + 900 + 9000 + 9\times10^{1000000}$

3. Which of the following describes an infinite series?

(a) $1 + 1 + 1 + 1 + ...$

(b) $1 - 1 + 1 - 1 + 1 - ... + (-1)^{34}$

(c) $1 - 1 - 1 - 1 - 1$

(d) $1 + 1 + 1 + 1 + 1$

4. Which of the following describes a finite series?

(a) $1 + 2 + 3 + 4 + ...$

(b) $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + ...$

(c) $1 + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^2 + \left(\frac{1}{4}\right)^2 + ...$

(d) $1 + \left(\frac{1}{2}\right)^3 + \left(\frac{1}{3}\right)^3 + \left(\frac{1}{4}\right)^3 + ... + \left(\frac{1}{100}\right)^3$

5. Which of the following describes a finite series?

(a) $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + ... - \left(\frac{1}{2}\right)^{17}$

(b) $1 + \frac{1}{2} + \frac{1}{4} - \frac{1}{8} - \frac{1}{16} + \frac{1}{32} + \frac{1}{64} - ...$

(c) $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + ...$

(d) $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + ...$

6. Which of the following describes an infinite series?

(a) $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + n + \ldots$

(b) $0.0 - 1.1 - 2.2 - 3.3 - 4.4 - ... - 20.20$

(c) $1 + 11 + 111 + 1111 + 11111 + ... + 111111111$

(d) $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \ldots + \frac{1}{n} + ... + \frac{1}{2000}$

7. Which of the following describes an infinite series?

(a) $1 + 2 + 4 + 8 + \ldots + 2^n + \ldots + 1024$

(b) $1 + 6 + 66 + 666 + ...$

(c) $1 + 1.9 + 1.99 + 1.999 + ... + 1.99999999$

(d) $10 + 10^2 + 10^3 + \ldots + 10^n + \ldots + 10^{1000000}$

8. Which of the following describes an infinite series?

(a) $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots + \frac{1}{2^n} + \ldots + \frac{1}{256}$

(b) $1 - 2 + 3 - 4 + 5 - \ldots + (-1)^{n+1} \cdot n + \ldots - 17$

(c) $1 - 1 - 1 - 1 - 1 - 1 - \ldots - 1^n - \ldots - 1^{100}$

(d) $1 - 2 + 3 - 4 + 5 - \ldots + (-1)^{n+1} \cdot n + \ldots$

9. Which of the following describes a finite series?

(a) $1 + 2^2 + 3^3 + 4^4 + ...$

(b) $1 + \frac{1}{e} + \frac{1}{e^2} + \frac{1}{e^3} + ...$

(c) $1 + e + e^2 + \ldots + e^n + \ldots + e^{100}$

(d) $1 + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^3 + \left(\frac{1}{4}\right)^4 + \ldots + \left(\frac{1}{n}\right)^n + \ldots$

10. Which of the following describes a finite series?

(a) $1 - 2 + 4 - 8 + \ldots + (-1)^n \cdot 2^n + ... - 2^{12}$

(b) $1 + 2^{10} + 3^{10} + \ldots + n^{10} + \ldots$

(c) $1 + \frac{1}{2^{10}} + \frac{1}{3^{10}} + \ldots + \frac{1}{n^{10}} + \ldots$

(d) $1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \ldots + \frac{1}{n^2} + \ldots$

Answers

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