

**Problems for Gateway #1: Distinguishing Geometric  
and Non-Geometric Series**

1. Which of the following is *NOT* a geometric series?

(a)  $1 + 0.1 + 0.01 + 0.001 + 0.0001 + \dots$

(b)  $1 + 0.2 + 0.03 + 0.004 + \dots$

(c)  $1 + 0.01 + 0.0001 + 0.000001 + \dots$

(d)  $0.2 + 0.02 + 0.002 + \dots$

2. Which of the following is *NOT* a geometric series?

(a)  $1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \dots + \left(\frac{1}{2}\right)^n + \dots$

(b)  $1 + 2 + 2^2 + 2^3 + \dots + 2^n + \dots$

(c)  $1 + 2^2 + 2^4 + 2^6 + \dots + 2^{2n} + \dots$

(d)  $1 + 2 + 3 + 4 + \dots + n + \dots$

3. Which of the following *IS* a geometric series?

(a)  $1 + 1 + 2 + \frac{1}{2} + 3 + \frac{1}{3} + \dots + n + \frac{1}{n} + \dots$

(b)  $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n} + \dots$

(c)  $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots + \frac{1}{2^n} + \dots$

(d)  $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots + \frac{1}{2 \cdot n} + \dots$



8. Which of the following **IS** a geometric series?

- (a)  $1 + 3 + 5 + \dots + (2n - 1) + \dots + 73$
- (b)  $1 + 4 + 9 + \dots + n^2 + \dots + 10000$
- (c)  $1 + 8 + 27 + \dots + n^3 + \dots + 1000$
- (d)  $-1 + 3 - 9 + 27 + \dots + (-1) \cdot (-3)^{n+1} + \dots$

9. Which of the following **IS** a geometric series?

- (a)  $1 + 9 + 81 + \dots + 9^n + \dots$
- (b)  $9 + 18 + 27 + \dots + 9n + \dots$
- (c)  $-1 + 3 + 7 + 11 + \dots + (-1 + 4 \cdot n) + \dots + 99$
- (d)  $1 + 0.2 + 0.03 + \dots + \frac{n}{10^{n-1}} + \dots + 0.00000009$

10. Which of the following **IS** a geometric series?

- (a)  $1 + 2 + 27 + \dots + n^n + \dots + 100^{100}$
- (b)  $0.9 + 1.9 + 2.9 + \dots + (n - 0.1) + \dots + 99.9$
- (c)  $10 + 9 + 8.1 + \dots + 10 \cdot (0.9)^n + \dots$
- (d)  $1 + 1 + 2 + 2 + 3 + 3 + 4 + 4 + \dots + n + n + \dots + 100 + 100$

### Answers

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