

# Question 1

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Find a formula for the general term of the sequence:

$$\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}, \dots$$

1.  $\left\{ \frac{2n}{2n-1} \right\}$

4.  $\left\{ \frac{n}{n+1} \right\}$

2.  $\left\{ \frac{2n}{2n+1} \right\}$

5.  $\left\{ \frac{3n-2}{3n-1} \right\}$

3.  $\left\{ \frac{2n-1}{2n} \right\}$

6. none of the above

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6. none of the above

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# Question 2

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Find a formula for the general term of the sequence:

$$1, \frac{1}{2}, \frac{1}{6}, \frac{1}{24}, \frac{1}{120}, \dots$$

1.  $\left\{ \frac{1}{n!} \right\}$

4.  $\left\{ \frac{1}{2n^2} \right\}$

2.  $\left\{ \frac{1}{2n} \right\}$

5.  $\left\{ \frac{1}{3n^3} \right\}$

3.  $\left\{ \frac{1}{n^4} \right\}$

6. none of the above

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6. none of the above

1.  $\left\{ \frac{1}{n!} \right\}$

# Question 3

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Find a formula for the general term of the sequence:

$$1, \frac{2}{1 + \ln 2}, \frac{4}{1 + \ln 3}, \frac{8}{1 + \ln 4}, \dots$$

1.  $\left\{ \frac{n}{n + \ln n} \right\}$

4.  $\left\{ \frac{2^n}{1 + \ln n} \right\}$

2.  $\left\{ \frac{2^n}{\ln(1+n)} \right\}$

5.  $\left\{ \frac{2^{n-1}}{1 + \ln n} \right\}$

3.  $\left\{ \frac{2n-1}{n + \ln n} \right\}$

6. none of the above

# Question 3

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Find a formula for the general term of the sequence:

$$1, \frac{2}{1 + \ln 2}, \frac{4}{1 + \ln 3}, \frac{8}{1 + \ln 4}, \dots$$

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5.  $\left\{ \frac{2^{n-1}}{1 + \ln n} \right\}$

3.  $\left\{ \frac{2n-1}{n + \ln n} \right\}$

6. none of the above

5.  $\left\{ \frac{2^{n-1}}{1 + \ln n} \right\}$

# Question 4

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What are the first three terms of the sequence

$$a_n = \frac{(2n - 1) \cdot n}{(n + 1) \cdot 2^n}$$

1.  $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

4.  $\frac{1}{4}, \frac{1}{2}, \frac{15}{32}$

2.  $\frac{1}{4}, \frac{3}{16}, \frac{5}{32}$

5.  $\frac{1}{4}, \frac{2}{5}, \frac{3}{7}$

3.  $\frac{1}{4}, \frac{1}{6}, \frac{1}{8}$

6. none of the above

# Question 4

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What are the first three terms of the sequence

$$a_n = \frac{(2n - 1) \cdot n}{(n + 1) \cdot 2^n}$$

1.  $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

4.  $\frac{1}{4}, \frac{1}{2}, \frac{15}{32}$

2.  $\frac{1}{4}, \frac{3}{16}, \frac{5}{32}$

5.  $\frac{1}{4}, \frac{2}{5}, \frac{3}{7}$

3.  $\frac{1}{4}, \frac{1}{6}, \frac{1}{8}$

6. none of the above

4.  $\frac{1}{4}, \frac{1}{2}, \frac{15}{32}$



# Question 5

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Determine whether the following sequence is increasing, decreasing, or neither:

$$a_n = \frac{1 + \sin n\pi}{n}$$

1. increasing
2. decreasing
3. neither
4. cannot be determined
5. first increasing, then decreasing
6. none of the above

# Question 5

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Determine whether the following sequence is increasing, decreasing, or neither:

$$a_n = \frac{1 + \sin n\pi}{n}$$

1. increasing
  2. decreasing
  3. neither
  4. cannot be determined
  5. first increasing, then decreasing
  6. none of the above
- 
2. decreasing
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