ILLINOIS PRECALCULUS · UNIT 4 · 25 QUESTIONS

Limits, Sequences, and Series — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 The limit $\lim_{x \to 4} (2x + 1)$ is

- A 7
- B 8
- C 9
- D 10

Understand It with Pulse | Flag a mistake

2 Find $\lim_{x \to 2} \frac{x^2 - 4}{x - 2}$.

- A 2
- B 3
- C 4
- D 0

Understand It with Pulse | Flag a mistake

3 Find $\lim_{x \to 3} \frac{x^2 - 9}{x - 3}$.

- **A** 3
- **B** 6
- **C** 9
- **D** 0

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4 Find $\lim_{x \to 2} \frac{x^3 - 8}{x - 2}$.

- **A** 4
- **B** 8
- **C** 12
- **D** 16

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5 Find $\lim_{x \to \infty} \frac{1}{x}$.

- **A** 1
- **B** 0
- **C** ∞
- **D** -1

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6 Find $\lim_{x \to \infty} \frac{3x^2}{x^2 + 1}$.

- **A** 0
- **B** 1
- **C** ∞
- **D** 3

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7 Find $\lim_{x \to 0} \frac{\sin x}{x}$.

- **A** 0
- **B** 1
- **C** -1
- **D** ∞

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8 Find $\lim_{x \to 4} \frac{\sqrt{x} - 2}{x - 4}$.

- **A** $\frac{1}{4}$
- **B** $\frac{1}{2}$
- **C** 1
- **D** 4

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9 The function $f(x) = \frac{x^2 - 1}{x - 1}$ has a removable discontinuity at

- **A** x = 0
- **B** x = 1
- **C** x = -1
- **D** no value

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10 For $a_n = 2n + 1$, the sixth term is

- **A** 11
- **B** 12
- **C** 13
- **D** 15

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11 For $a_n = n^2 - 1$, the fifth term is

- A 24
- B 25
- C 23
- D 26

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12 In an arithmetic sequence with $a_1 = 3$ and common difference 4, the tenth term is

- A 35
- B 39
- C 43
- D 40

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13 **The sum of the first 10 terms of an arithmetic sequence with $a_1 = 2$ and common difference 3 is**

A 135

B 155

C 165

D 145

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14 **In a geometric sequence with $a_1 = 2$ and common ratio 3, the fifth term is**

A 54

B 81

C 162

D 243

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15 The sum of the first 4 terms of 3, 6, 12, 24 is

- A 45
- B 42
- C 48
- D 39

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16 The sum of the infinite geometric series with $a_1 = 12$ and $r = \frac{1}{3}$ is

- A 16
- B 18
- C 24
- D 36

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17 The sum of the infinite geometric series with $a_1 = 8$ and $r = \frac{1}{2}$ is

- A 12
- B 16
- C 20
- D 24

Understand It with Pulse | Flag a mistake

18 The sum $\sum_{k=1}^{5} k^2$ is

- A 30
- B 55
- C 50
- D 25

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19 The sum $\sum_{k=1}^{4} 2k$ is

- A 16
- B 18
- C 20
- D 24

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20 The limit of the sequence $a_n = \frac{2n}{n+1}$ as $n \to \infty$ is

- A 0
- B 1
- C 2
- D ∞

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21 The sequence 5, 9, 13, 17 has common difference

- A 2
- B 3
- C 5
- D 4

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22 The sequence 4, 12, 36, 108 has common ratio

- A 2
- B 3
- C 4
- D 8

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23 The sum of the first 6 odd positive integers is ____.

ANSWER _____

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24 For $a_n = 3n - 2$, the eighth term is ____.

ANSWER _____

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25 For $a_1 = 2$ and $a_{n+1} = 2a_n + 1$, the fourth term is ____.

ANSWER _____

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ANSWER KEY

1.	C	**10.**	C	**19.**	C
2.	C	**11.**	A	**20.**	C
3.	B	**12.**	B	**21.**	D
4.	C	**13.**	B	**22.**	B
5.	B	**14.**	C	**23.**	36
6.	D	**15.**	A	**24.**	22
7.	B	**16.**	B	**25.**	23
8.	A	**17.**	B		
9.	B	**18.**	B		

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