ILLINOIS PRECALCULUS · FINAL EXAM · 50 QUESTIONS

Final Exam — 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 **If f(x) = x + 4 and g(x) = 2x, then f(g(3)) is**

- A 6
- B 7
- C 10
- D 14

Understand It with Pulse | Flag a mistake

2 The smallest nonnegative solution of $\sin x = \frac{1}{2}$ is

- A $\frac{\pi}{3}$
- B $\frac{5\pi}{6}$
- C $\frac{\pi}{2}$
- D $\frac{\pi}{6}$

Understand It with Pulse | Flag a mistake

3 The transverse axis length of $\frac{x^2}{16} - \frac{y^2}{9} = 1$ is

- A 3
- B 4
- C 6
- D 8

Understand It with Pulse | Flag a mistake

4 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

5 If $f(x) = x^2$ and $g(x) = f(x + 2)$, then $g(-1)$ is

- **A** 9
- **B** 4
- **C** 1
- **D** 3

Understand It with Pulse | Flag a mistake

6 **The value of tan 45° is**

- A 0
- B $\frac{1}{2}$
- C 1
- D $\sqrt{3}$

Understand It with Pulse | Flag a mistake

7 **The focus of $(x - 1)^2 = 8(y - 2)$ is**

- A (1, 4)
- B (1, 0)
- C (3, 2)
- D (-1, 2)

Understand It with Pulse | Flag a mistake

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

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

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9 The inverse of f(x) = 2x + 6 is

- **A** $f^{-1}(x) = \frac{x - 6}{2}$
- **B** $f^{-1}(x) = \frac{x + 6}{2}$
- **C** $f^{-1}(x) = 2x - 6$
- **D** $f^{-1}(x) = \frac{x}{2} + 6$

Understand It with Pulse | Flag a mistake

10 If $\sin\theta = \frac{3}{5}$ and θ is in Quadrant I, then $\cos\theta$ is

- **A** $\frac{4}{5}$
- **B** $-\frac{4}{5}$
- **C** $\frac{3}{4}$
- **D** $\frac{5}{4}$

Understand It with Pulse | Flag a mistake

11 The radius of $(x - 3)^2 + (y + 2)^2 = 25$ is

- **A** 25
- **B** 5
- **C** 10
- **D** $\sqrt{5}$

Understand It with Pulse | Flag a mistake

12 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

Understand It with Pulse | Flag a mistake

13 The function $f(x) = x^2 + 5$ is

- **A** odd
- **B** neither even nor odd
- **C** even
- **D** both even and odd

Understand It with Pulse | Flag a mistake

14 The value of sec 60° is

- A $\frac{1}{2}$
- B $\sqrt{3}$
- C $\frac{2}{\sqrt{3}}$
- D 2

Understand It with Pulse | Flag a mistake

15 For $\frac{x^2}{25} + \frac{y^2}{9} = 1$, the foci are

- A (± 4, 0)
- B (± 3, 0)
- C (± 5, 0)
- D (0, ± 4)

Understand It with Pulse | Flag a mistake

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

A 35

B 39

C 43

D 40

Understand It with Pulse | Flag a mistake

17 **The range of $f(x) = x^2 + 2$ is**

A $y \geq 0$

B $y > 2$

C $y \geq 2$

D $y \leq 2$

Understand It with Pulse | Flag a mistake

18 The graph shows $y = 2 \cos x$. The value of y when x = 0 is

- A 0
- B 1
- C 2
- D -2

Understand It with Pulse | Flag a mistake

19 The vertices of $\frac{y^2}{25} - \frac{x^2}{16} = 1$ are

- A (± 4, 0)
- B (0, ± 4)
- C (± 5, 0)
- D (0, ± 5)

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20 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

Understand It with Pulse | Flag a mistake

21 The graph shows the parabola $y = (x - 2)^2 + 1$. The vertex is

- A (2, 1)
- B (-2, 1)
- C (2, -1)
- D (1, 2)

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22 The value of $\sin^{-1}\frac{1}{2}$ is

A $\frac{\pi}{6}$

B $\frac{\pi}{3}$

C $\frac{5\pi}{6}$

D $-\frac{\pi}{6}$

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23 The midpoint of (2, 3) and (6, 7) is

A (4, 5)

B (3, 5)

C (4, 10)

D (8, 10)

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

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

Understand It with Pulse | Flag a mistake

25 The x-intercept of f(x) = 3x - 12 is

- A -4
- B 12
- C -12
- D 4

Understand It with Pulse | Flag a mistake

26 The value of sin 30° is

A $\frac{\sqrt{3}}{2}$

B 1

C $\frac{\sqrt{2}}{2}$

D $\frac{1}{2}$

Understand It with Pulse | Flag a mistake

27 The radius of $(x - 2)^2 + y^2 = 9$ is ____.

ANSWER _____

Understand It with Pulse | Flag a mistake

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

A 2

B 3

C 4

D 8

Understand It with Pulse | Flag a mistake

29 The inverse of $f(x) = \frac{x}{3} - 2$ is

A $f^{-1}(x) = 3x - 2$

B $f^{-1}(x) = \frac{x}{3} + 2$

C $f^{-1}(x) = 3x + 6$

D $f^{-1}(x) = 3x - 6$

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30 **The value of sin 90° is ____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

31 **The vertex of $y = x^2 - 6x + 5$ is**

A (3, -4)

B (-3, -4)

C (3, 4)

D (-3, 4)

Understand It with Pulse | Flag a mistake

32 Find $\lim_{x \to 5} (x^2 - 4)$.

A 21

B 25

C 20

D 29

Understand It with Pulse | Flag a mistake

33 The domain of $f(x) = \sqrt{2x + 6}$ is

A $x \geq -3$

B $x > -3$

C $x \leq -3$

D $x \geq 3$

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34 The value of cos 60° is

- A $\frac{\sqrt{3}}{2}$
- B $\frac{1}{2}$
- C 1
- D 0

Understand It with Pulse | Flag a mistake

35 The center of $(x + 1)^2 + (y - 4)^2 = 16$ is

- A (1, 4)
- B (-1, 4)
- C (1, -4)
- D (-1, -4)

Understand It with Pulse | Flag a mistake

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

- **A** 0
- **B** 1
- **C** 2
- **D** 3

Understand It with Pulse | Flag a mistake

37 The inverse of f(x) = 5x - 10 is

- **A** $f^{-1}(x) = \frac{x + 10}{5}$
- **B** $f^{-1}(x) = \frac{x - 10}{5}$
- **C** $f^{-1}(x) = 5x + 10$
- **D** $f^{-1}(x) = \frac{x}{5} - 10$

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38 The reference angle for 315° is

- A 45°
- B 135°
- C 15°
- D 75°

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39 For $\frac{x^2}{16} + \frac{y^2}{25} = 1$, the foci are

- A (± 3, 0)
- B (0, ± 3)
- C (0, ± 4)
- D (± 4, 0)

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40 **The sum of the first 5 terms of an arithmetic sequence with $a_1 = 1$ and common difference 2 is**

- A 20
- B 25
- C 30
- D 15

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41 **The graph of y = f(-x) is the graph of y = f(x) reflected across the**

- A x-axis
- B line y = x
- C y-axis
- D origin

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42 The amplitude of $y = 3 \cos x + 1$ is

- A 1
- B 3
- C 4
- D 2

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43 The equation $\frac{x^2}{9} - \frac{y^2}{4} = 1$ represents a

- A circle
- B parabola
- C ellipse
- D hyperbola

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44 **The sequence 2, 6, 18, 54 has common ratio**

A 2

B 3

C 4

D 6

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45 **The function $f(x) = x^4 + 2x^2$ is**

A odd

B neither even nor odd

C linear

D even

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46 If $\cos\theta = \frac{4}{5}$ and $\sin\theta = \frac{3}{5}$, then $\cos 2\theta$ is

- **A** $\frac{7}{25}$
- **B** $\frac{24}{25}$
- **C** $\frac{16}{25}$
- **D** $\frac{9}{25}$

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47 The value of p for $x^2 = 12y$ is ____.

ANSWER _____

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48 For $a_n = n^2 + 2n$, the fourth term is ____.

ANSWER _____

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49 If $f(x) = x^2 - 4x$, then $f(6) - f(2)$ is

- A 8
- B 12
- C 20
- D 16

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50 The value of $\sin 270°$ is

- A 1
- B 0
- C $\frac{1}{2}$
- D -1

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ANSWER KEY

1. C
2. D
3. D
4. C
5. C
6. C
7. A
8. D
9. A
10. A
11. B
12. B
13. C
14. D
15. A
16. B
17. C
18. C
19. D
20. B
21. A
22. A
23. A
24. C
25. D
26. D
27. 3
28. B
29. C
30. 1
31. A
32. A
33. A
34. B
35. B
36. C
37. A
38. A
39. B
40. B
41. C
42. B
43. D
44. B
45. D
46. A
47. 3
48. 24
49. D
50. D

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