MASSACHUSETTS 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 π/3
- B 5π/6
- C π/2
- D π/6

Understand It with Pulse | Flag a mistake

3 **The transverse axis length of $x^2/16 - y^2/9 = 1$ is**

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

Understand It with Pulse | Flag a mistake

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

- 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 $\lim_{x \to \infty} 3x^2/x^2 + 1.$

- A 0
- B 1
- C ∞
- D 3

Understand It with Pulse | Flag a mistake

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

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

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** -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 $f(x) = x^2 - 1/x - 1$ 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 $2/\sqrt{3}$
- D 2

Understand It with Pulse | Flag a mistake

15 For $x^2/25 + y^2/9 = 1$, 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

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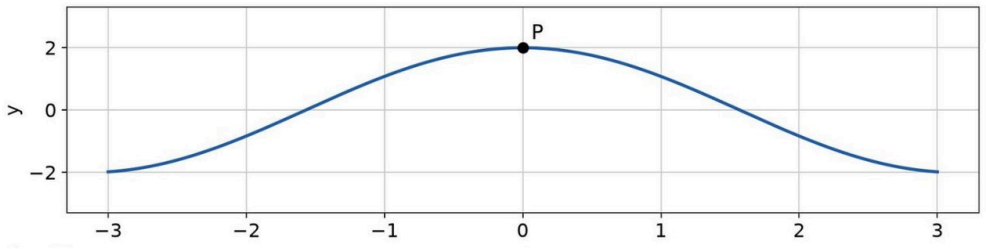

A 0
B 1
C 2
D -2

A 0

B 1

C 2

D -2

Understand It with Pulse

Flag a mistake

19 The vertices of $y^2/25 - x^2/16 = 1$ are

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

Understand It with Pulse | Flag a mistake

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**

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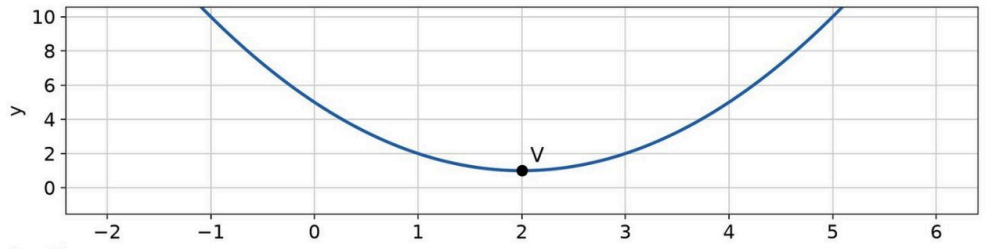

A (2, 1)
B (-2, 1)
C (2, -1)
D (1, 2)

A (2, 1)

B (-2, 1)

C (2, -1)

D (1, 2)

Understand It with Pulse

Flag a mistake

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

A π/6

B π/3

C 5π/6

D -π/6

Understand It with Pulse | Flag a mistake

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

A (4, 5)

B (3, 5)

C (4, 10)

D (8, 10)

Understand It with Pulse | Flag a mistake

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

B 1

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

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) = x/3 - 2 is**

- A $f^{-1}(x) = 3x - 2$
- B $f^{-1}(x) = x/3 + 2$
- C $f^{-1}(x) = 3x + 6$
- D $f^{-1}(x) = 3x - 6$

Understand It with Pulse | Flag a mistake

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** $x \geq 3$

Understand It with Pulse | Flag a mistake

34 The value of cos 60° is

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

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 $\lim_{x \to \infty} 2x + 1/x + 3$.**

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 $f^{-1}(x) = x + 10/5$

B $f^{-1}(x) = x - 10/5$

C $f^{-1}(x) = 5x + 10$

D $f^{-1}(x) = x/5 - 10$

Understand It with Pulse | Flag a mistake

38 **The reference angle for 315° is**

- A 45°
- B 135°
- C 15°
- D 75°

Understand It with Pulse | Flag a mistake

39 **For $x^2/16 + y^2/25 = 1$, the foci are**

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

Understand It with Pulse | Flag a mistake

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

Understand It with Pulse | Flag a mistake

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

Understand It with Pulse | Flag a mistake

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

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

Understand It with Pulse | Flag a mistake

43 The equation $x^2/9 - y^2/4 = 1$ represents a

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

Understand It with Pulse | Flag a mistake

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

- A 2
- B 3
- C 4
- D 6

Understand It with Pulse | Flag a mistake

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

- A odd
- B neither even nor odd
- C linear
- D even

Understand It with Pulse | Flag a mistake

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** $\frac{9}{25}$

Understand It with Pulse | Flag a mistake

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

ANSWER _____

Understand It with Pulse | Flag a mistake

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

ANSWER _____

Understand It with Pulse | Flag a mistake

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

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

Understand It with Pulse | Flag a mistake

50 The value of $\sin 270°$ is

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

Understand It with Pulse | Flag a mistake

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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