

Calculus Readiness Test Preparation

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The Calculus Readiness Test is used to place you into the appropriate calculus course at USF. This is a 30-minute online test, with 24 multiple-choice questions. No calculators are permitted. You may only take this test once; all subsequent scores will not be accepted. Below is a list of topics on the exam, followed by a practice test to help you prepare.

Topics covered

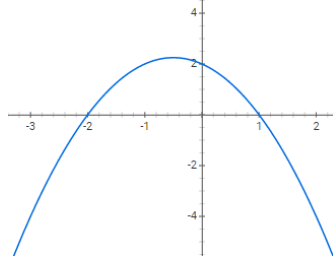
1. Simplification of algebraic expressions
2. Solving equations and inequalities
3. Working with functions: Graphing functions, composition of functions, the inverse of a function, etc.
4. Familiar families of functions: Lines, parabolas, exponential functions, logarithmic functions, trigonometric functions and basic trigonometric identities.
5. Measurements: area, perimeter, volume, and other quantities

Sample Test

- $(8)^{1/3}(81)^{-1/4} =$
 - 6
 - $\frac{3}{2}$
 - $(648)^{-1/12}$
 - $\frac{2}{3}$
- If you know that 2^{12} is approximately 4,000, then which of the following is the best approximation for 2^{24} ?
 - 8,000
 - 16,000
 - 4×10^6
 - 1.6×10^7
- If $\log_4(x + 3) = 2$, then $x =$
 - 1
 - 13
 - 5
 - 3
- The line $y = x + 1$ and the parabola $y = 2x^2$ intersect when $x = 1$ and when $x =$
 - $\frac{1}{2}$
 - $-\frac{1}{2}$
 - 2
 - 2
- The inequality $|x - 3| \leq 4$ is equivalent to
 - $x \leq 7$
 - $x \leq -1$
 - $-1 \leq x \leq 7$
 - $-7 \leq x \leq -7$
- Which of the following is a solution of $\log_2(x + 1) - \log_2(x - 2) = 2$?
 - $x = 0$
 - $x = 1$
 - $x = 2$
 - $x = 3$

7. If $f(x)$ is a function whose graph is shown below, then $f(x) > 0$ whenever

- (A) $x > 2$
- (B) $x > 0$
- (C) $-2 < x < 1$
- (D) $x < -2$ or $x > 1$



8. Which of the following is an equation of a line that passes through the points $(1, -3)$ and $(3, 2)$?

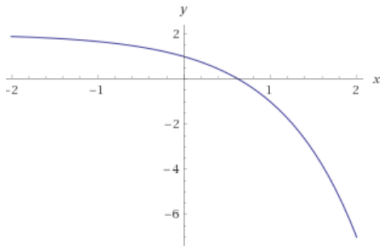
- (A) $y - 2 = \frac{2}{5}(x - 3)$
- (B) $y + 2 = \frac{5}{2}(x + 3)$
- (C) $y - 3 = \frac{2}{5}(x + 1)$
- (D) $y + 3 = \frac{5}{2}(x - 1)$

9. If $f(x) = \frac{x^2 - 5}{x + 5}$, then $f(a + 2) =$

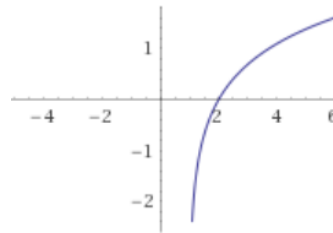
- (A) $a - 3$
- (B) $\frac{a^2 + 4a - 1}{a + 7}$
- (C) $\frac{a^2 - 1}{a + 7}$
- (D) $-\frac{1}{7}$

10. Which of the graphs below could be a sketch of $f(x) = -3^x + 2$?

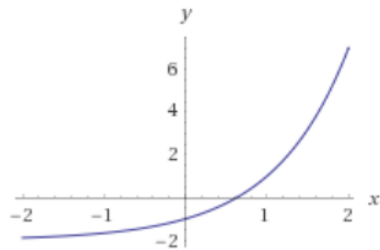
(A)



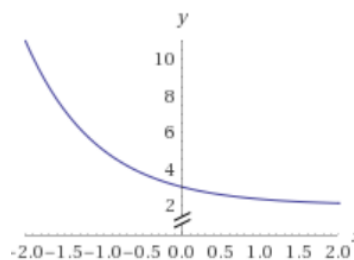
(C)



(B)

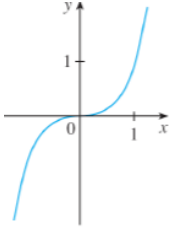


(D)

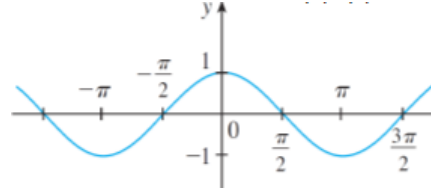


11. A function f is called even if $f(-x) = f(x)$. Which of the functions shown below is even?

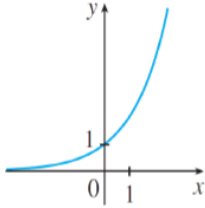
(A)



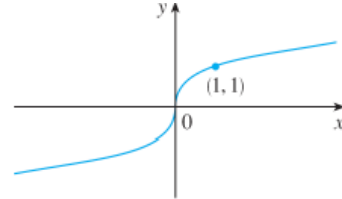
(C)



(B)



(D)



12. The line $y = 3x - 5$ is perpendicular to

(A) $y = -3x - 5$

(B) $x + 3y = 6$

(C) $4y - 12x = 5$

(D) $y = 3x + 2$

13. If $f(x) = \sqrt[3]{x-1}$, then the inverse function $f^{-1}(x) =$

(A) $(x-1)^3$

(B) $x^3 + 1$

(C) $(x-1)^{-1/3}$

(D) $x^3 - 1$

14. If $f(x) = x^2$ and $g(x) = 3x + 1$, then the composition $(f \circ g)(x) =$

(A) $3x^2 + 1$

(B) $3x^3 + x^2$

(C) $9x^2 + 1$

(D) $9x^2 + 6x + 1$

15. A population starts with 100 individuals and doubles in size every 5 years. How many individuals will there be in 25 years?

(A) 3200

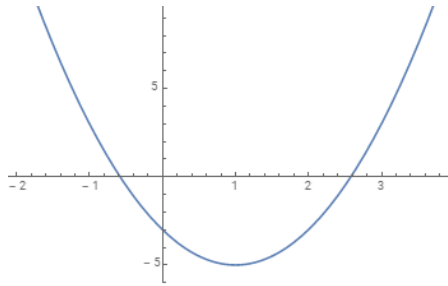
(B) 500

(C) 2500

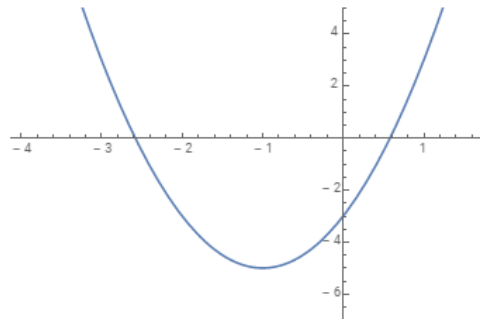
(D) 100^5

16. Which of the following graphs represents the graph of $y = 2x^2 - 4x - 3$?

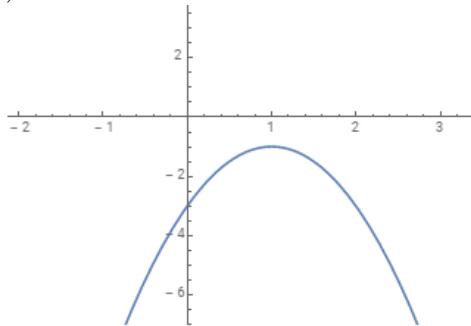
(A)



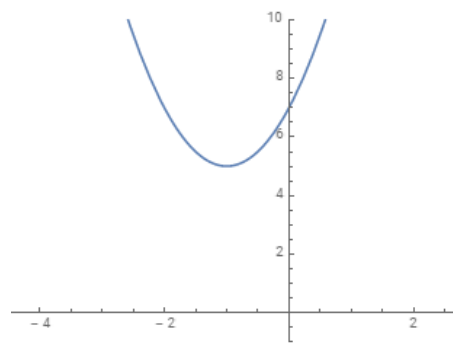
(C)



(B)



(D)



17. If $f(x) = \cos 3x$, then $f(\pi/6) =$

(A) 0

(B) $\frac{1}{2}$

(C) $\frac{\sqrt{3}}{2}$

(D) 1

18. $\sec\left(-\frac{\pi}{3}\right) =$

(A) $\frac{1}{2}$

(B) 2

(C) $-\frac{2}{\sqrt{3}}$

(D) -2

19. For which value of x is $\tan x$ *not* defined?

(A) $\pi/4$

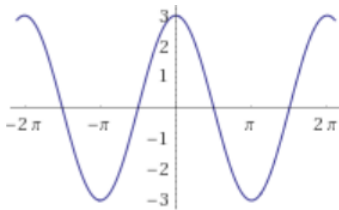
(B) π

(C) $-\pi/2$

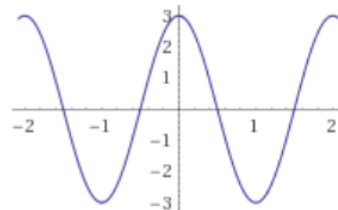
(D) $\pi/3$

20. Which of the following is a graph of $y = 3 \cos(\pi x)$?

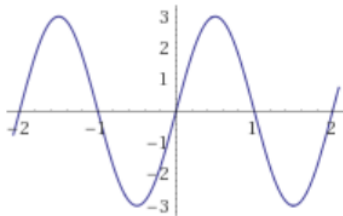
(A)



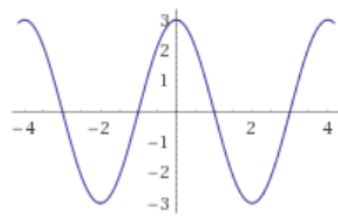
(C)



(B)



(D)



21. $\sin^2 \theta \cot \theta \sec \theta =$

- (A) $\sin \theta$
- (B) $\cos \theta$
- (C) $\sin \theta \cot \theta$
- (D) $\sin \theta \cot^2 \theta$

22. $\cos^2 \theta - 1 =$

- (A) $\sin \theta$
- (B) $\cos 2\theta$
- (C) $\sin^2 \theta$
- (D) $-\sin^2 \theta$

23. $\tan^{-1} 1 =$

- (A) $\pi/4$
- (B) $\pi/2$
- (C) 0
- (D) π

24. If the sides of a cube increase by a factor of 2, then the volume of the cube increases by a factor of

- (A) 2
- (B) 6
- (C) 8
- (D) Not enough information to tell.

Answers

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