

Training for Test 1

Fundamentals of Calculus I

Explain and justify your thought process.

1. For $f(x) = x^2 + 8x + 27$, find

- (a) the minimum of $f(x)$
- (b) the maximum of $f(x)$
- (c) the y-intercept of $f(x)$
- (d) all solutions to $f(x) = 2$.

discussed in class

2. Find $\lim_{x \rightarrow 3} \frac{2x^2 - 18}{x - 3}$ discussed in class

3. What is the limit definition of continuity at a point $x = a$? discussed in class

4. Find $\lim_{x \rightarrow \infty} \frac{5x^3 + 3x^2 - \pi}{2x^5 + 17x^2 + 5x - 2}$. discussed in class

5. Find all solutions to $\log_3(x - 2) + \log_3(x + 6) = 2$. discussed in class

6. For

$$h(x) = \begin{cases} 3 & \text{if } x \geq 2 \\ -1 & \text{if } x < 2 \end{cases}$$

What is the $\lim_{x \rightarrow 2^-} h(x)$? Is $h(x)$ continuous? discussed in class

7. Evaluate $\log_{12}(\log_9(\log_5(\log_2 32)))$. You can reduce the solution to $\log_{12} 0 = -\infty$.

8. What is the domain and range of $e^{(e(x))} + 3$? domain is all real numbers; range is $(3, \infty)$.

9. Does the graph below depict $a(x) = 3 + 1/x$, $b(x) = 3^{-x}$, or $c(x) = 3^{x^2}$? b(x)

10. What is the definition of an exponential function? how does such a function grow or decay? a number raised to a variable power, which is a function decaying or growing exponentially.

