

ELEMENTARY CALCULUS 1 - FALL 2024 - EXAM 2A - Solutions

- F 1) Every function $f(x)$ has a limit at $x = 2$
- F 2) If $f(x)$ has the limit 5 when $x = 3$, then $f(3) = 5$
- T 3) Polynomial functions have limits at any real number
- F 4) Rational functions have limits at any real number
- T 5) The function $f(x) = \frac{x+3}{x^2+2}$ has a limit at every real number
- T 6) If a function is continuous at $x = c$ then it has a limit at c
- T 7) A constant function is continuous on its domain
- F 8) If a function has a limit at a point, it is continuous there
- T 9) Exponential functions are continuous
- F 10) The average rate of change is given by the derivative
- T 11) The difference of two continuous functions is continuous
- T 12) x^2e^x is a continuous function on the real line
- F 13) $\frac{x+1}{x^2+1}$ is discontinuous at some points
- T 14) $\frac{x+1}{x^2-1}$ is discontinuous at some points
- F 15) The sum of two discontinuous functions is never continuous
- T 16) The sum of two continuous functions is never discontinuous
- T 17) $\lim_{x \rightarrow 5^+} \frac{1}{x-5} = +\infty$
- F 18) $\lim_{x \rightarrow 5^-} \frac{1}{x-5} = +\infty$
- T 19) If $f(x)$ is discontinuous, $[f(x)]^2$ could still be continuous
- F 20) If $f(x) = x^4$ then $f'(x) = x^3$
- T 21) If $s(t) = 16t^2$ then $s'(t) = 32t$
- T 22) A derivative is the limit of a quotient
- T 23) Derivatives give instantaneous rates of change
- F 24) The second derivative of distance as a function of time is speed
- F 25) The derivative of a constant can be 1