ELEMENTARY CALCULUS 1 - FALL 2024 - EXAM 3A - Solutions

20 minutes - no references. Each question worth two points. Total 50 points = half of Exam 3. True or false:

F 1) Every function is differentiable at all points of its domain

F 2) If a function is continuous at a point it is differentiable there

T 3) Polynomial functions can be differentiated everywhere

F 4) Rational functions can be differentiated everywhere

T 5) e^x is its own derivative

T 6) Every derivative is a limit

T 7) The derivative of a constant is always zero

F 8) The chain rule applies to a product of differentiable functions

F 9) $\overline{C}(x) = \frac{C(x)}{x}$ is the marginal average cost function

F 10) If $f(x)$ and $g(x)$ have derivatives, the derivative of the product is the product of derivatives

F 11) The derivative of a constant times a function is always zero

T 12) 2^x has a derivative everywhere

T 13) The derivative of $\frac{x+1}{x^2+1}$ is always defined for any x

F 14) The derivative of $\frac{x+1}{x^2-1}$ is always defined for any x

T 15) The sum of two differentiable functions is always differentiable

T 16) If the derivative is positive at a point, it means the function is increasing

T 17) The derivative of five times a function is five times the derivative of the function

F 18) Its possible for a function to have a derivative where it is not continuous

F 19) The derivative of a quotient is the quotient of derivatives except when the denominator is zero

T 20) The general power rule is the chain rule applied to the power rule

T 21) The derivative of the log of a function is the relative rate of change

T 22) A derivative is the limit of a difference quotient

F 23) A constant derivative means the function is constant

T 24) The derivative of $e^{\ln x}$ with respect to x is 1

F 25) The derivative of x^2 with respect to y is $2y$