

AP Calculus – Across and Down

Clue Set: #7

Topic: Derivatives – Derivatives of Inverses, Linear Approximation

Only digits (0 – 9) and negative signs are allowed. If an answer is an integer, use leading zeros to make the answer fit. (Ex: If 4 digits are required and your answer is 46, enter 0046.) If an answer has decimal places, the decimal point is dropped and trailing zeros are used to make the answer fit to the required number of decimal places which is specified in the problem. (Ex: If 2 decimal places are required and your answer is 12.4682, round to 12.47 and enter 1247. If one decimal place is required and your answer is 15, write 15.0 and enter 150. If one decimal place is required and your answer is 0.5, write 05.)



Across

A9. If $f(x) = \sin 2x$, find the linear approximation for $f(\pi + 0.075)$ using the tangent line to f at $x = \pi$.

A24. The function f is differentiable for all real numbers. The table to the right gives values of the function and its derivatives at $x = -2$ and $x = 4$. If f^{-1} is the inverse function of f , and $y = xf^{-1}(x)$, find $\frac{dy}{dx}$ at $x = -2$.

x	$f(x)$	$f'(x)$
-2	3	$-1/3$
4	-2	$-2/7$

Down

D27. (Gr. Calc.) If $f(x) = \frac{x}{20} + \frac{\sin^2 x}{10}$ and $g(x) = f^{-1}(x)$, find $g'(0.3)$ accurate to one decimal place.

D51. For the function f , $f(10) = -54$ and $f'(x) = 18 - 4x$. What is the approximation for $f(9.98)$ found by using the tangent line to the graph of f at $x = 10$? (2 decimal place accuracy)

D60. (Sci. Calc.) If $f(x) = (2 - 3x)^3$, find the positive difference between $f(2)$ and the approximation to $f(2.04)$ using the linear approximation to f at $x = 2$ (one decimal place).