

ANSWER ON QUESTION #58171 – MATH – CALCULUS

QUESTION

If $f(x) = (\arctan(x))^4 + 3\arctan(x) + 5$, then $f'(x) =$

SOLUTION

IF

$$f(x) = \arctan^4(x) + 3\arctan(x) + 5 \quad (1)$$

THEN

$$f'(x) = \frac{4\arctan^3(x) + 3}{x^2 + 1} \quad (2)$$

BECAUSE FROM THE RULES OF DIFFERENTIATING OF COMPOSITE FUNCTION

$$f'(x) = 4\arctan^3(x)(\arctan(x))' + 3(\arctan(x))' + (5)' \quad (3)$$

AND FROM TABLES OF DERIVATIVES

$$(z^4)' = 4z^3$$

$$(\arctan(x))' = \frac{1}{1+x^2} \quad (4)$$

$$(5)' = 0 \quad (5)$$

NOW ONE CAN OBTAIN (2) COMBINING (3), (4) AND (5).

ANSWER: $f'(x) = \frac{4\arctan^3(x) + 3}{x^2 + 1}$.