

TEST 3:

HW:

MAPLE Assignment

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**The Final Grade for TEST 3:**

I. (15%) Find the equation of the tangent line to the curve

$$y = 2 \sin(\pi x - y)$$

at the point  $(1, 0)$ .

II. (15%) Find the derivative of the function:

$$f(x) = \sin^{-1} x + \tan^{-1} x$$

III. (15%) Find the derivative of the function:

$$f(x) = x \ln(x^2 + 1).$$

IV. (15%) Represent number  $e$  as a limit.

V. (15%) Let

$$y(x) = x^3 + 2x + 3.$$

- a) Find the differential  $dy$ .
- b) Evaluate  $dy$  and  $\Delta y$  given that  $x = 2$  and  $dx = \Delta x = 0.1$ .
- c) Sketch a diagram showing the line segments with lengths  $dx$ ,  $dy$ , and  $\Delta y$

VI. (15%) Find the absolute maximum and absolute minimum values of the function

$$f(x) = x + 2 \sin x$$

on the interval  $[-\pi, \pi]$ .

VII. (10%) Find the critical points of the function

$$f(x) = x^{1/3}(4 - x)$$