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# PRECISION

LOSS OF



~~Accuracy~~

NEAR

$$x = 0, \pi/2, \frac{5\pi}{2}$$

$$f(0.200) = e^{-(0.2)} + \sin(0.2) - 1$$

$$\approx 0.819 + 0.199 - 1.000 = 0.018$$

EXACT SOLUTION

IS 0.017

SO THIS DIGIT IS INCORRECT

AN EQUIVALENT FORM OF  $f(x) = e^{-x} + \sin x - 1$

IS ITS TAYLOR EXPANSION...



$$f(x) \approx \frac{x^2}{2} - \frac{x^3}{3} + \frac{x^4}{24} + \frac{x^6}{720}$$

$$f(0.200) \approx \frac{(0.200)^2}{2} - \frac{(0.200)^3}{3} + \frac{(0.200)^4}{24} + \dots$$

$$\dots + \frac{(0.200)^6}{720}$$

$$\approx 0.020 - 0.003 + 0.000$$

$$= 0.017$$

THIS DIGIT IS NOW CORRECT