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MATH 400-01
2/15/2022

Homework 02

1. $f(x) = e^{1-x^2}$, $x_0 = 1$, 4P

Soln: Let $a = x_0 = 1$

$f(x) = e^{1-x^2}$

$f'(x) = -2e^{1-x^2}x$

$f''(x) = (-2)(e^{1-x^2} - 2x^2e^{1-x^2})$

$f'''(x) = (-2)(4x^3e^{1-x^2} - 6xe^{1-x^2})$

$f^{(4)}(x) = (-2)(-8x^4e^{1-x^2} + 24x^2e^{1-x^2} - 6e^{1-x^2})$

Hence: $P_0(x) = f(a) = 1$

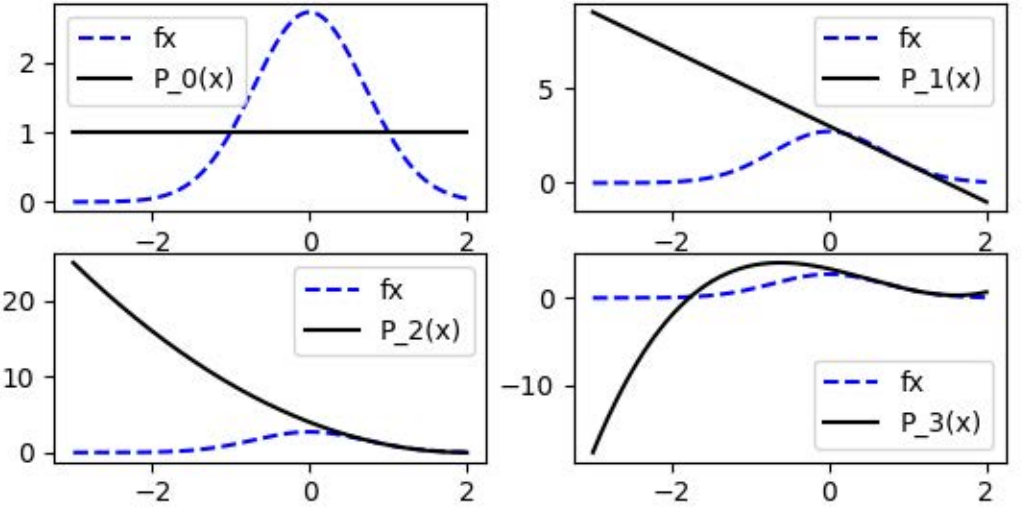
$P_1(x) = P_0(x) - 2(x-1)$

$P_2(x) = P_1(x) + (x-1)^2$

$P_3(x) = P_2(x) + \frac{2}{3}(x-1)^3$

$P_4(x) = P_3(x) + (x-1)^4$

Graph: Graph is in "shixin_wang_homework_question_01.pdf"


fx
P_0(x)
fx
P_1(x)
fx
P_2(x)
fx
P_3(x)