

name: Solution

1 (12 points). Use linear approximation to estimate $\ln(1.05)$.

• Find the tangent line to $f(x) = \ln(x)$

@ $x=1$ $y=f(1)=\ln(1)=0$.

• $f'(x) = \frac{1}{x}$ @ $x=1 \Rightarrow f'(1) = 1$

$$y - 0 = 1(x - 1) \Rightarrow y = x - 1$$

• Plug in $x=1.05$: $y = 1.05 - 1 = \underline{\underline{0.05}}$