Mathematics 122

Quiz # 9 Name: Key

You must show your work to get full credit.

1. Let $f(x)$ be given by the table

x	0	5	10	15
$f(x)$	23	30	40	52

Complete the following tables for $f'(x)$ and $f''(x)$

x	2.5	7.5	12.5
$f'(x)$	1.4	2	2.4

x	5	10
$f''(x)$	.12	.08

① $\frac{\Delta b}{\Delta x} = \frac{30-23}{5-0} = \frac{7}{5} = 1.4$

② $\frac{\Delta b}{\Delta x} = \frac{40-30}{10-5} = \frac{10}{5} = 2$

③ $\frac{\Delta b}{\Delta x} = \frac{52-40}{15-10} = \frac{12}{5} = 2.4$

ⓐ $\frac{\Delta b'}{\Delta x} = \frac{2-1.4}{7.5-2.5} = \frac{.6}{5} = .12$

ⓑ $\frac{\Delta b'}{\Delta x} = \frac{2.4-2}{12.5-7.5} = \frac{.4}{5} = .08$

2. Let \$2,000 be invested at 5% compounded continuously.

(a) What is the principle after t years?

$P(t) =$ $2000e^{.05t}$

(b) How long until this investment reaches \$5,000?

We need to solve $P(t) = 2000e^{.05t} = 5000$

$e^{.05t} = \frac{5000}{2000}$

$.05t = \ln(5000/2000)$

$t = \ln(5000/2000)/.05$

$= 18.33$

Time to \$5,000 is 18.33 years