

Sheet 5

(1) Use the following data to evaluate $f'(1.005), f'(1.015)$

x	1	1.01	1.02
y	1.27	1.32	1.38

(2) Given the point (0.2,4). (2.3,6). (4.4,3). (6.5,9). (10.3,8) on the curve of the function $y = f(x)$ Find the approximate value of f', f'' at the points $x = 4, x = 6, x = 0.5$.

(3) From the following table evaluate y', y'' at $x = 0.50$

x	0.35	0.40	0.45	0.50	0.55	0.60	0.65
y	1.5215	1.50542	1.4880	1.4675	1.4442	1.4180	1.3887

(4) Use the following table to compute $f''(1.3)$ in the case $h = 0.1, h = 0.01$

x	1.2	1.29	1.30	1.31	1.4
y	11.59006	13.78176	14.04276	14.30741	16.86187

(5) Use the forward-difference formulas and backward-difference formulas to determine each missing entry in the following tables.

x	0.5	0.6	0.7
y	0.4794	0.5646	0.6442
y'			

- (6) Use an appropriate formula to determine, as accurately as possible, approximations for each missing entry in the following tables.

x	1.05	1.10	1.15	1.20	1.25	1.30
y	-1.7098	-1.3738	-1.1192	-0.9160	-0.7470	-0.6016
y'						

- (7) Consider the following table of data,

x	0.2	0.4	0.6	0.8	1.0
$f(x)$	0.9799	0.9178	0.8080	0.6386	0.3844

- a) Use all the appropriate formulas given in this section to approximate $f'(0.4)$ and $f''(0.4)$.
- b) Use all the appropriate formulas given in this section to approximate $f'(0.6)$ and $f''(0.6)$.

- (8) Let $f(x) = 3xe^x - \cos x$. Use the following data to approximate $f''(1.3)$ with $h = 0.1$ and with $h = 0.01$.

x	1.20	1.29	1.30	1.31	1.40
$f(x)$	11.59006	13.78176	14.04276	14.30741	16.86187

Compare your results to $f''(1.3)$.