

## [12.1] - Double integrals from data

Some of the values of the function  $f(x, y)$  are given in the table below:

	<b>x=20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>
<b>y=80</b>	77	78	79	81	82
<b>85</b>	82	84	86	88	90
<b>90</b>	87	90	93	96	100
<b>95</b>	93	96	101	107	114
<b>100</b>	99	104	110	120	132

Estimate

$$\int_{y=80}^{100} \int_{x=20}^{60} f(x, y) dx dy \approx \sum_{i=1}^2 \sum_{j=1}^2 f(x_{ij}^*, y_{ij}^*) \Delta x \Delta y \quad (1)$$

where  $\Delta x = 20$  and  $\Delta y = 10$ . (That is, the 2 X 2 light overlay). Which point to use in each sub-rectangle? Try:

1. midpoints

2. points farthest away from the origin