[12.1] - Double integrals from data

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

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

Estimate

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

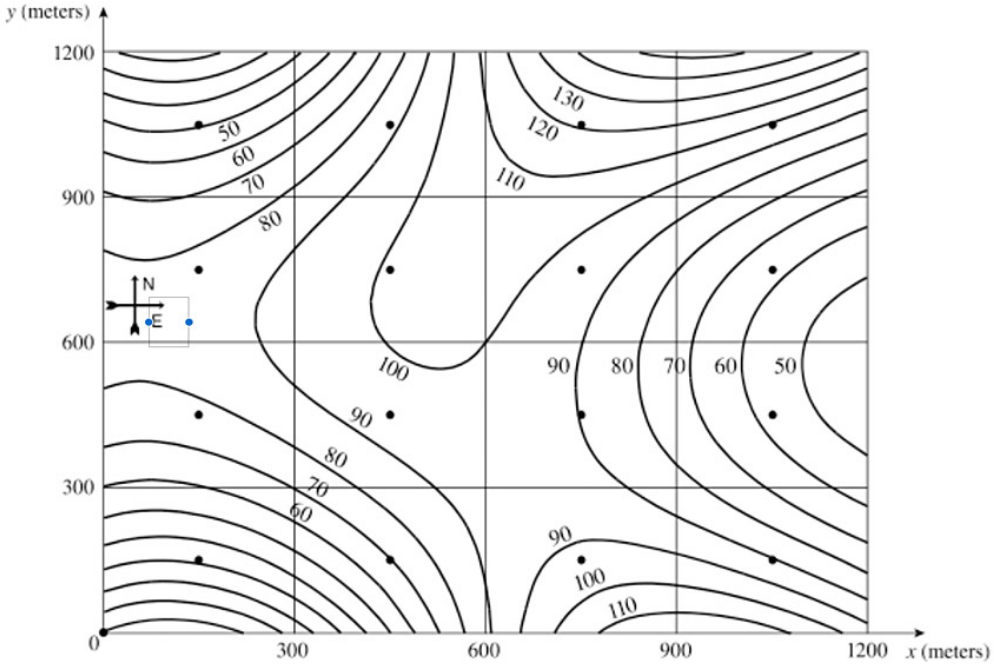
where $\Delta x = 20$ and $\Delta y = 10$. (That is, the 2 X 2 light overlay). Which point to use in each sub-rectangle? Try:

1. midpoints

2. points farthest away from the origin

[12.1] - Back to the park

The following is a map showing contour lines for a region of Orangerock National Park.



Estimate (numerically) the average elevation by sampling the elevation at the mid-point of each sub-rectangle.