In a survey of a piece of oceanfront property, measurements of the distance to the water, $D(x)$, were made every 80 ft. along a 320-foot side. Use Trapezoid Rule to estimate the area of the property.
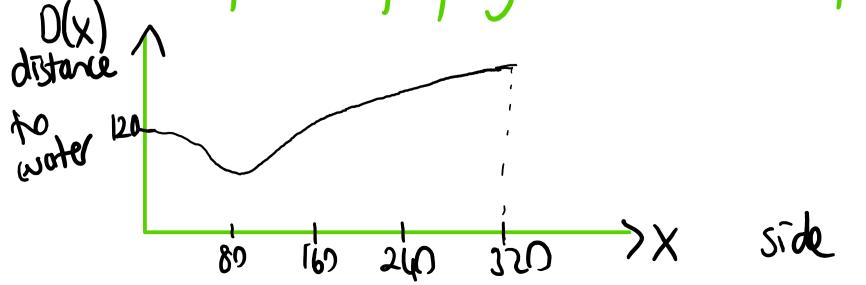
X	0	80	160	240	320
D(x)	120	70	125	170	220

Identify x-values: $a = X_0 = 0, \; X_1 = 80, \; X_2 = 160, \; X_3 = 240, \; X_4 = 320$

$$n = 4, \qquad \Delta x = \frac{X_4 - X_0}{4} = \frac{320 - 0}{4} = 80$$

Set-up $T(4)$

$$T(4) = \left(\frac{1}{2} \cdot D(0) + D(80) + D(160) + D(240) + \frac{1}{2} \cdot D(320) \right) \cdot 80$$

$$= \left(\frac{1}{2} \cdot 120 + 70 + 125 + 170 + \frac{1}{2} \cdot 220 \right) \cdot 80 = 42,800 \text{ sq. ft.}$$

The area of the property is est. as $42,800$ sq. ft.

side measure