

1. Estimate the area under the curve $y = x^2$ on the interval $[0, 4]$ in five different ways:
 - a. Divide $[0, 4]$ into four equal subintervals, and use the left endpoint on each subinterval as the sample point.
 - b. Divide $[0, 4]$ into four equal subintervals, and use the right endpoint on each subinterval as the sample point.
 - c. Divide $[0, 4]$ into four equal subintervals, and use the midpoint of each subinterval as the sample point.
 - d. Divide $[0, 4]$ into eight equal subintervals, and use the left endpoint on each subinterval as the sample point.
 - e. Divide $[0, 4]$ into eight equal subintervals, and use the right endpoint on each subinterval as the sample point.

For each of the above, draw a rough sketch. Use your sketch to help determine which estimates will give areas that are larger than the desired area, and which will give areas smaller than the desired area.