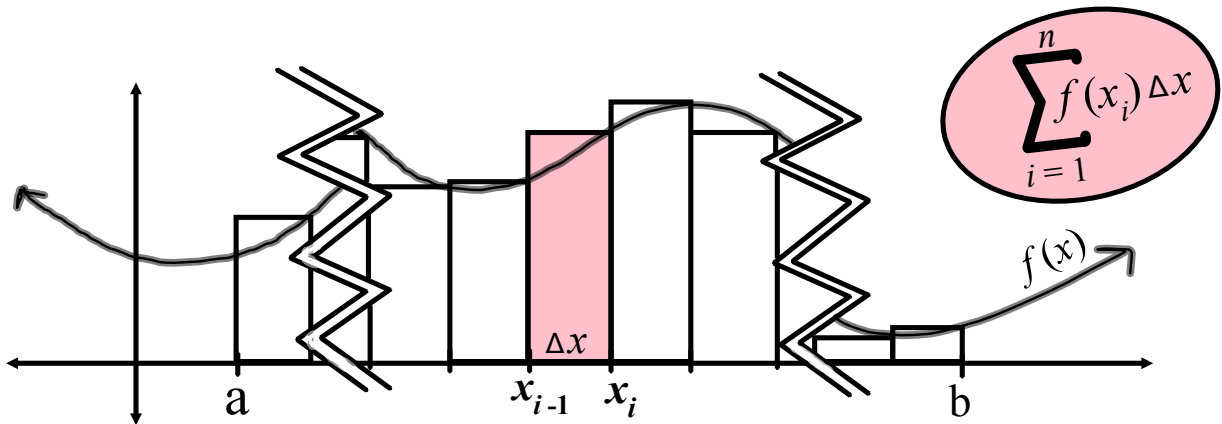# Calculus AB

The following is an approximation for area beneath a curve using Right Hand estimation. The formula used to find such an area is called a **Riemann Sum**.

$$\sum_{i=1}^{n} f(x_i)\Delta x$$

$f(x)$

$\Delta x$

$x_{i-1}$  $x_i$

$a$          $b$

1) What does $x_i$ equal in terms of $a$?  $x_i = $ _____

2) What is $a$ in terms of $x$?  $a = $ _____

3) What does $b$ equal in terms of $a$?  $b = $ _____

4) To get a better estimate of the area, what must be true of $n$? _____

5) As $n$ increases, which value must decrease? _____

6) To get an exact area, what must we do? _____

7) As the limit as $n \longrightarrow \infty$ , $\Delta x \longrightarrow$ _____

Definite Integral -

Find the area bounded by the $x$-axis and $f(x) = x^2$ between 0 and 2.
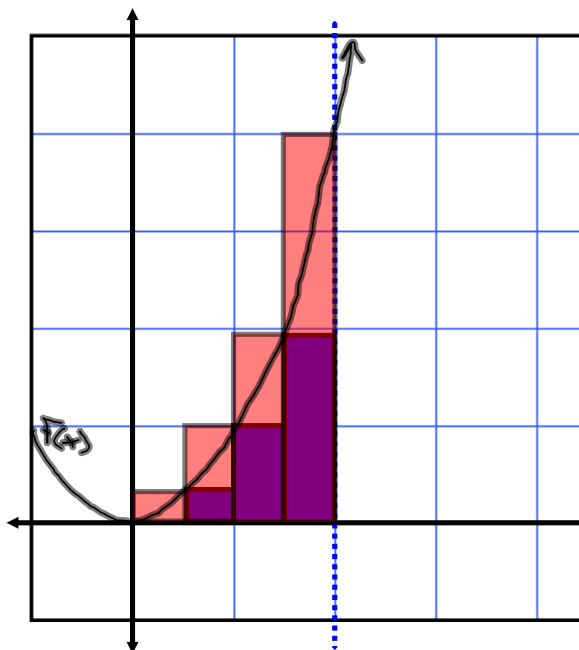
$f(x)$
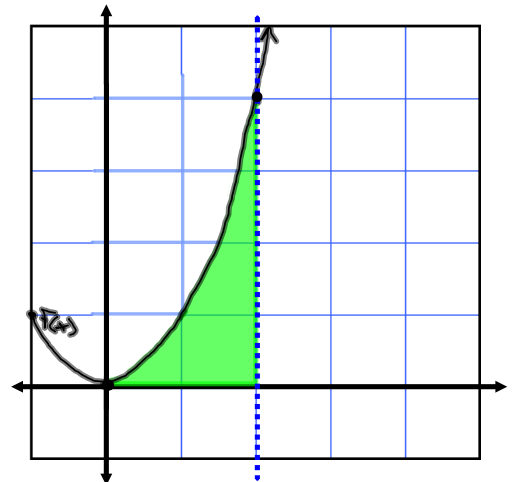
Compare all.

Right Hand estimate -

Left Hand estimate -

Midpoint estimate -

Average of Left and Right -

Actual area using integrals -

$f(x)$

Use the limit process to find the area of the region between the graph of the function and the $x$-axis over the indicated interval.

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58) $y = 3x - 2$ [2,5]

70) $f(y) = 4y - y^2$ [1,2]