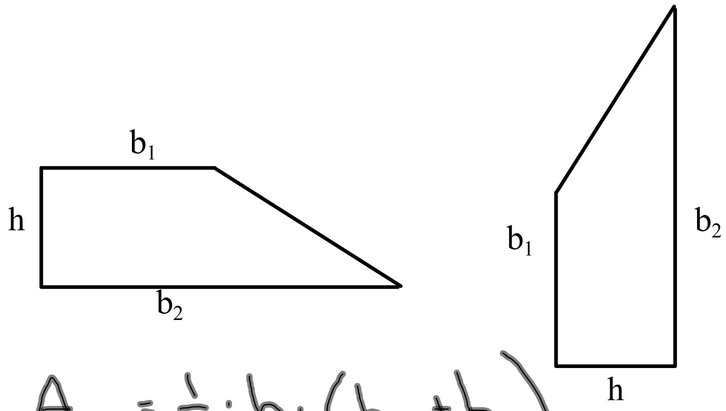
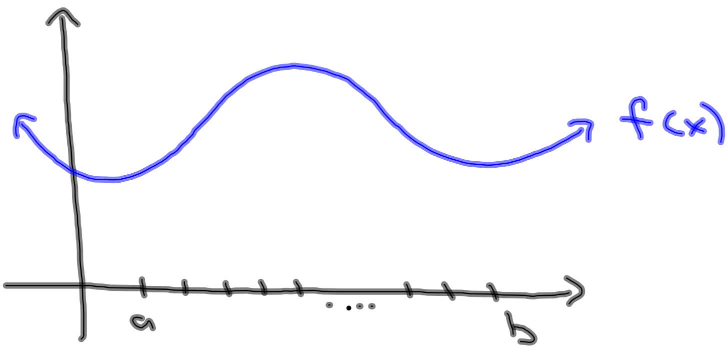
5-5 Trapezoid Rule



$$A_T = \frac{1}{2} \cdot h \cdot (b_1 + b_2)$$



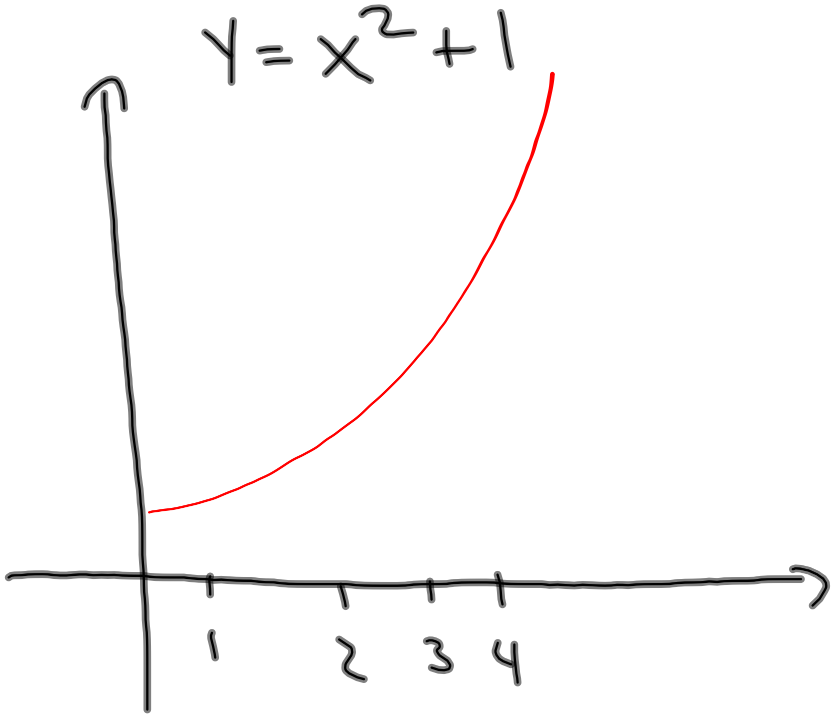
All (n) trapezoids:

$$T = \frac{1}{2}h(y_0 + y_1) + \frac{1}{2}h(y_1 + y_2) + \frac{1}{2}h(y_2 + y_3) ..$$

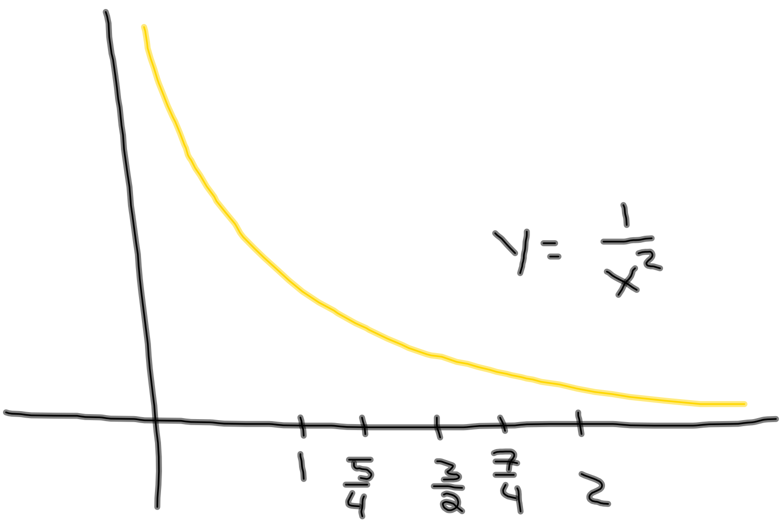
$$\ldots \frac{1}{2}h(y_{n-1} + y_n)$$

$$T = \frac{h}{2}(y_0 + y_1 + y_1 + y_2 + y_2 + y_3 + \ldots y_{n-1} + y_n)$$

$$\boxed{T = \frac{h}{2}(y_0 + 2y_1 + 2y_2 + \ldots + 2y_{n-1} + y_n)}$$

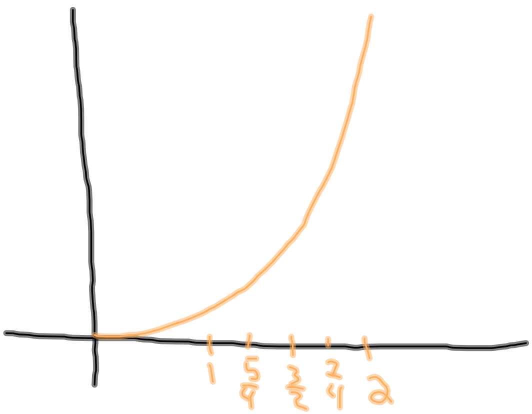


$$\int_0^4 (x^2+1)\,dx \approx$$



$y = \frac{1}{x^2}$
1
$\frac{5}{4}$
$\frac{3}{2}$
$\frac{7}{4}$
2

$\int_1^2 x^2 \, dx$ Estimate using trap rule w/ $n=4$.



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2010 AB 2

a) $\frac{E(7)-E(5)}{7-5} = 4$ hundred entries per hour.

b) $\frac{1}{8}\int_0^8 E(t)\,dt =$

$\frac{1}{8}\Big[\frac{1}{2}\big(2(E(0)+E(2)) + 3(E(2)+E(5)) +$

$2(E(5)+E(7)) + 1(E(7)+E(8))\big)\Big]$

$= \underline{10.688}$

average number of entries in the box between noon and 8 p.m.

$$\int_8^{12} (x^3 - 30x^2 + 298x - 976)\,dx$$
$= 16$

$23 - 16 = 7$ hundred entries

$23 - \int_8^{12} P(t)\,dt = 7$

d) $P'(t) = 0$ at $t = 9.1835$ and $t = 10.8165$

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t	$P(t)$
8	0
9.1835	
10.8165	2.911
12	8