MAT 126, Lecture 1, Sept 1, 2020

Write in Σ notation: $1+2+3+\ldots+20$

$$\sum_{i=1}^{20} i$$

Write in Σ notation: $1+3+5+7\ldots+101$

$$\sum_{k=1}^{51} (2k-1)$$

Expand and evaluate: $\Sigma_{n=1}^{3} n^2$

$$= 1^2 + 2^2 + 3^2$$

$$= 1 + 4 + 9$$

$$= 14$$

Expand and evaluate: $\Sigma_{k=0}^{5} 2^n$

$$= 2^0 + 2^1 + 2^2 + 2^3 + 2^4 + 2^5$$

$$= 1 + 2 + 4 + 8 + 16 + 32$$

$$= 63$$

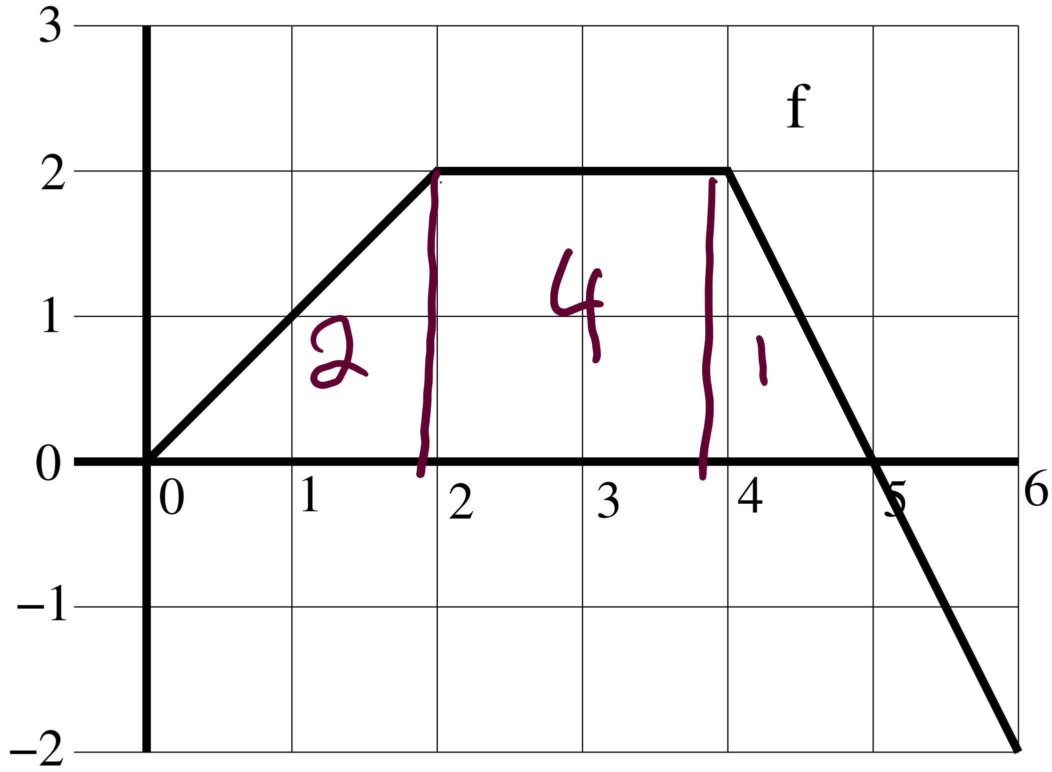
Evaluate: $\sum_{n=1}^{100} n$

Use $\displaystyle\sum_{k=1}^{n} k = \frac{(n+1)(n)}{2}$

$$\sum_{n=1}^{100} n = \frac{(101)(100)}{2} = 101 \cdot 50$$

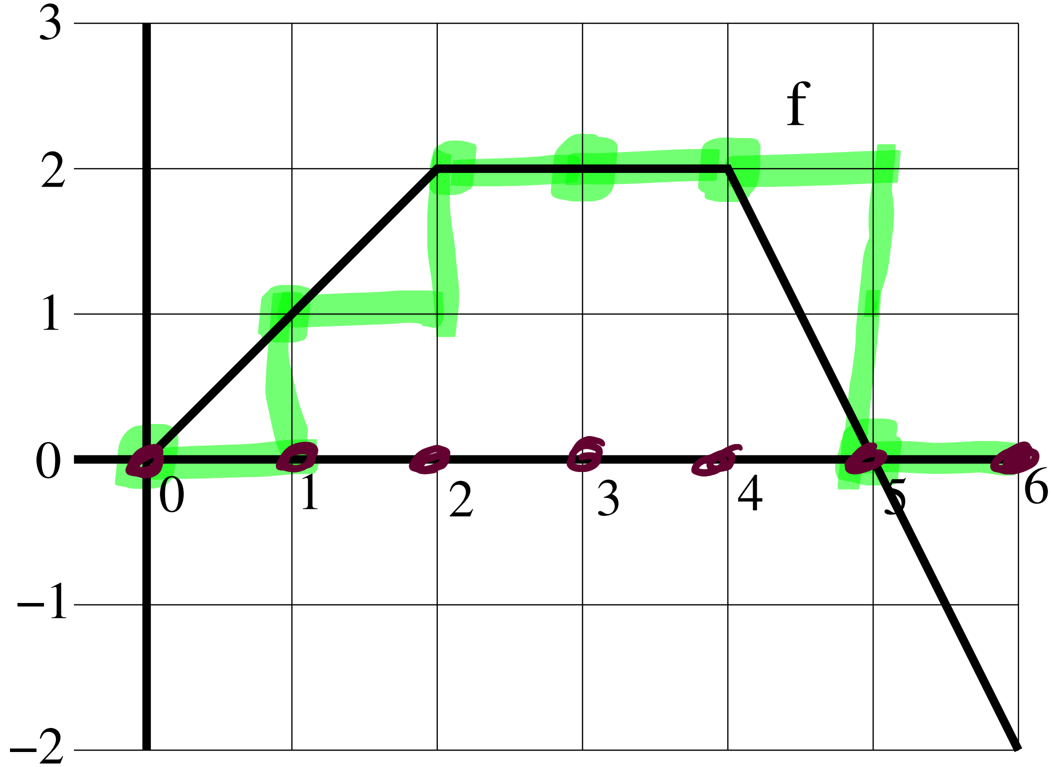
$$= 5050$$

Find $\int_0^6 f(x)dx$ exactly using areas.



$2 + 4 + 1 = 7$

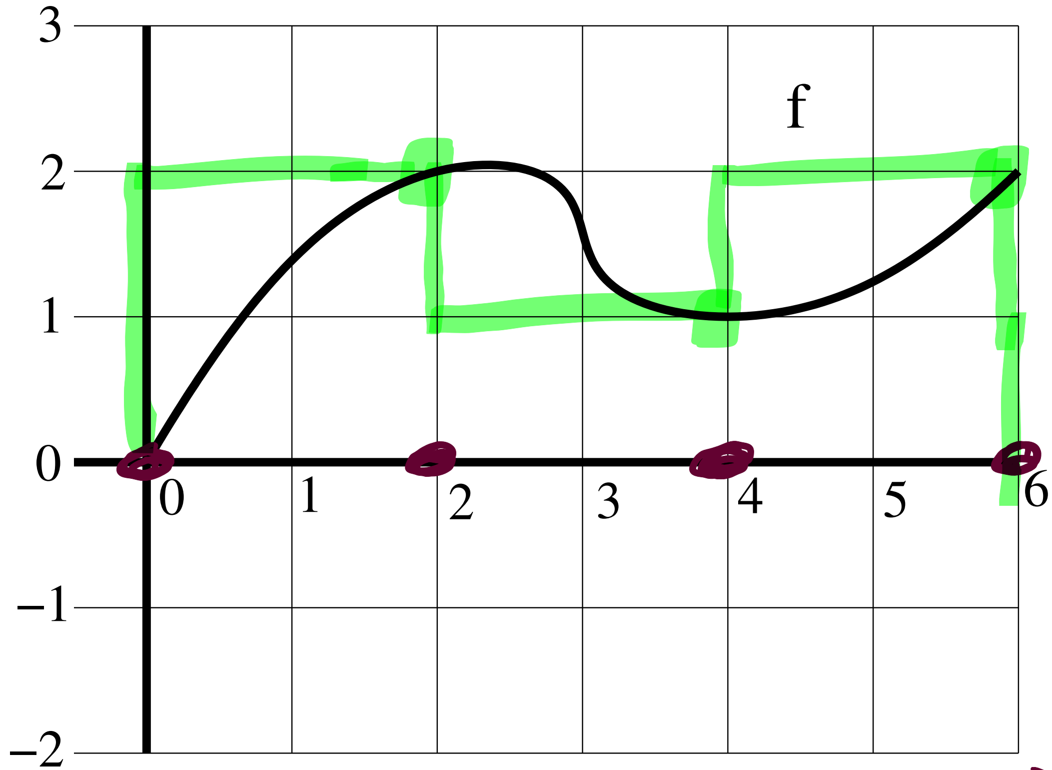
Approximate $\int_0^6 f(x)dx$ using 6 intervals and left-hand rule.



$$LHR = (0 \cdot 1) + (1 \cdot 1) + (2 \cdot 1) + (2 \cdot 1) + (2 \cdot 1) + (0 \cdot 1)$$

$$= 7$$

Approximate $\int_0^6 f(x)dx$ using 3 intervals and right-hand rule.



$$\text{RHR} = (2\cdot 2) + (1\cdot 2) + (2\cdot 2)$$

$$= 4 + 2 + 4$$

$$= 10$$