

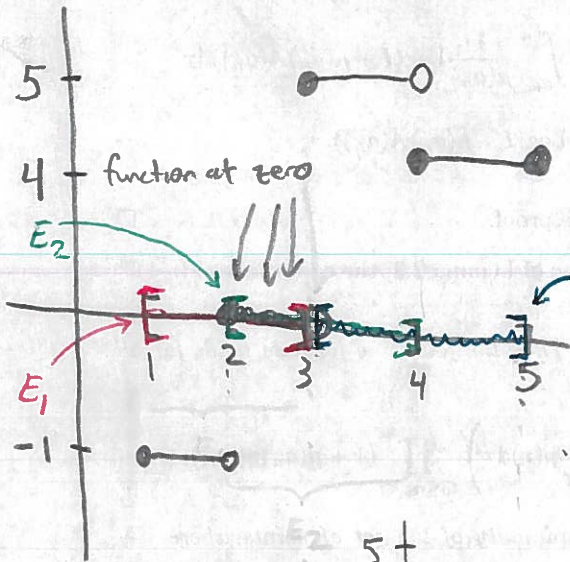
HW12 (MATH 4590)

① $m([3,10]) = 7$

② $m([1,3] \cup [2,4] \cup [3,5]) = m([1,5]) = 4$



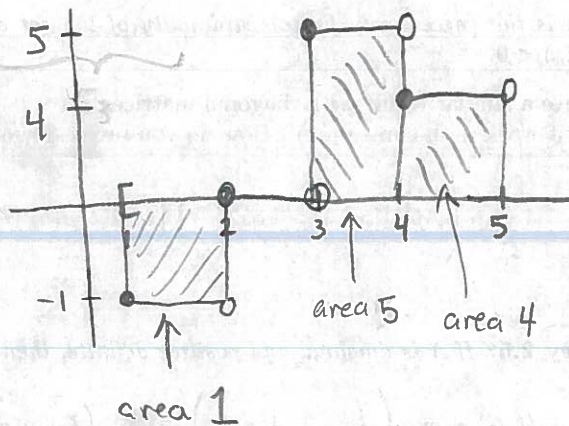
③



$$\psi(x) = \sum_{k=1}^3 (2k-3) \chi_{E_k}(x)$$

$$= (-1)\chi_{E_1}(x) + (1)\chi_{E_2}(x) + (4)\chi_{E_3}(x)$$

④ a) As Riemann:



Riemann integral: $-1 + 0 + 5 + 4 = 8$

⑥ As Lebesgue:

$$\begin{aligned} \int \psi &= (-1) \underbrace{m(E_1)}_{m([1,3])=2} + 1 \underbrace{m(E_2)}_{m([2,4])=2} + 4 \underbrace{m(E_3)}_{m([3,5])=2} \\ &= -2 + 2 + 8 \\ &= 8 \end{aligned}$$

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