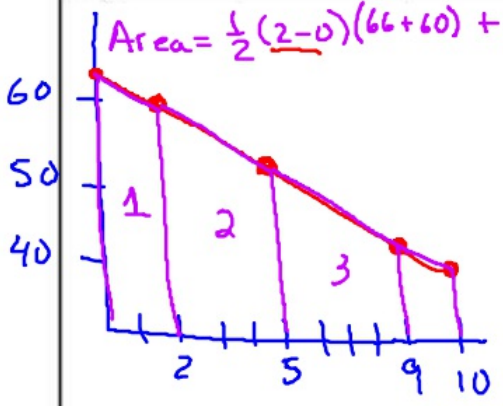
Area Trap

$\frac{1}{2}\,h(b_1+b_2)$ — b_1, b_2: y-values; h: Δx

1. Use the data below and 4 sub-intervals to approximate the area under the curve using the **Trapezoidal approximations**.

t	0	2	5	9	10
H(t)	66	60	52	44	43

$\text{Area} = \frac{1}{2}(2-0)(66+60) + \frac{1}{2}(5-2)(60+52) + \frac{1}{2}(9-5)(52+44) + \frac{1}{2}(10-9)(44+43)$



2. Use the data below and 4 sub-intervals to approximate the area under the curve using **Trapezoidal approximations**.

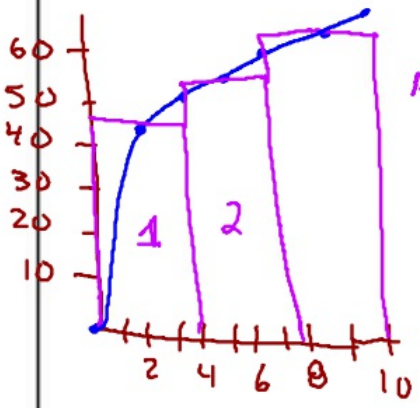
t(hours)	0	2	5	7	8
E(t) (hundreds of entries)	0	4	13	21	23

$A = \frac{1}{2}(2-0)(4+0) + \frac{1}{2}(5-2)(4+13) + \frac{1}{2}(7-5)(13+21) + \frac{1}{2}(8-7)(23-21)$

Riemann Sums – Rectangles (Left / Right / Midpoint)

4. Use the data below to approximate the area under the curve using **Midpoint Riemann Sums** with 3 sub-intervals.

T	0	2	4	6	8	10	12
P(t)	0	46	53	57	60	62	65



Area = (4-0)(46) + (8-4)(57) + (12-8)(62)

13. Use the data below to approximate the area under the curve using a **midpoint Riemann sum** with 3 sub-intervals

T (sec)	0	60	120	180	240	300	360
a(t) ft/sec^2	24	30	28	30	26	24	26

A = (120-0)(30) + (240-120)(30) + (360-240)(24)