TO APPROXIMATE $\int_a^b f(x)\,dx$: $\Delta x = \frac{b-a}{n} \rightarrow$ # SUBINTERVALS

LRAM : $\Delta x \left(\underbrace{y_0 + y_1 + \cdots + y_{n-1}}_{\text{"n" OF THESE}} \right)$

RRAM: $\Delta x \left(\overbrace{y_1 + y_2 + \cdots + y_n} \right)$

TRAP : $\frac{1}{2} \Delta x \left(\underbrace{y_0 + 2y_1 + 2y_2 + \cdots + 2y_{n-1} + y_n}_{\text{"n+1" OF THESE}} \right)$

ONLY VALID IF ALL SUBINTERVALS ARE SAME WIDTH (Δx)

HR t	mph $v(t)$
0	10
1	58
2	67
3	95
4	0
5	55
6	30

APPROXIMATE $\int_0^6 v(t)\,dt \Rightarrow$ THIS WILL APPROX. TOTAL DIST. TRAVELED.

LRAM = $1\,(10+58+67+95+0+55) = 285$ MILES

RRAM = $1\,(58+67+\cdots+55+30) = 305$ MILES

TRAP = $\frac{1}{2}\cdot 1\,(10+2(58)+2(67)+\cdots+2(55)+30)$

$= 295$ MILES.

Δt	t	$v(t)$
	0	10
1	1	58
2	3	95
3	6	30

APPROXIMATE $\int_0^6 v(t)\,dt$ — NOTICE WE HAVE 3 SUBINTERVALS OF UNEQUAL LENGTH.

LRAM = $1(10) + 2(58) + 3(95) = 411$ MILES

RRAM = $1(58) + 2(95) + 3(30) = 338$ MILES

TRAP = $\frac{1}{2}\cdot 1\,(10+58) + \frac{1}{2}\cdot 2\,(58+95) + \frac{1}{2}\cdot 3\,(95+30)$

$= \boxed{374.5 \text{ MILES}}$