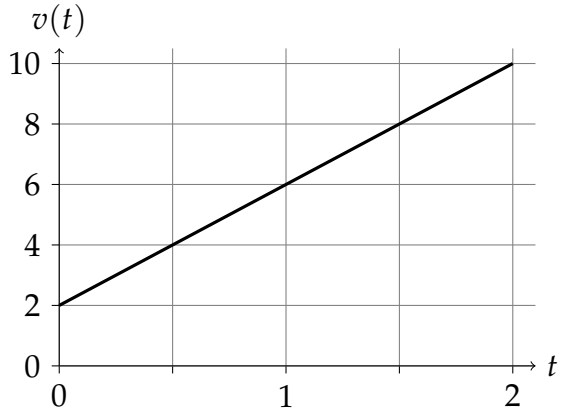
Lecture Handout #21: Nov 10

Distance Change from Velocity

Velocity of a toy wind-up car: starts at 2 m/s, increases steadily for 2 s



t	0		1/2		1
$v(t)$	2				

t		3/2		2
$v(t)$				10

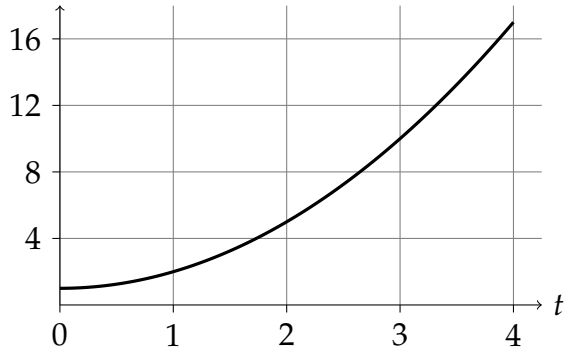
Time interval	Underestimate	Overestimate	Difference	Actual distance:
1 sec	8 m			m
sec				
sec				

Total Change in Volume from Flow Rate

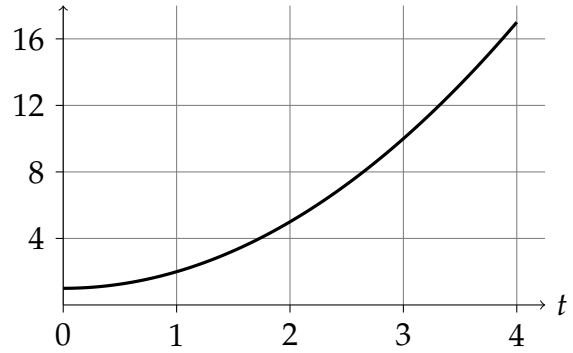
Time t (s):	0	1	2	3	4	5	Left-hand estimate:	
Flow rate $f(t)$ (l/s):	8	14	20	12	6	4	Right-hand estimate:	

Bacterial Population from Growth Rate

Bacteria grow at $f(t) = 1 + t^2$ million per hour in a 4-hour time period



$n = 4$ $\Delta t = 1$ Pop $\approx$ _____



$n = 8$ $\Delta t = \frac{1}{2}$ Pop $\approx$ _____