

Adding lots of numbers.

$$4 + 6 + 8 + 10 + 12 = 40$$

$$5 + 10 + 17 + 26 + 37 + 50 = 145$$

$$\begin{aligned} &\rightarrow (4+1) + (9+1) + (16+1) + (25+1) + (36+1) + (49+1) \\ &= (2^2+1) + (3^2+1) + (4^2+1) + (5^2+1) + (6^2+1) + (7^2+1) \end{aligned}$$

Mathematical shorthand:

$$\begin{aligned} &= \sum_{k=2}^7 (k^2+1) = \text{"summation from } k=2 \text{ to } k=7 \text{ of } k^2+1\text{"} \\ &= 145. \end{aligned}$$

$$\begin{aligned} \sum_{k=2}^7 (k^2+1) &= \overset{k=2}{(2^2+1)} + \overset{k=3}{(3^2+1)} + \overset{k=4}{(4^2+1)} + \overset{k=5}{(5^2+1)} \\ &\quad + \overset{k=6}{(6^2+1)} + \overset{k=7}{(7^2+1)}. \end{aligned}$$

Write this in shorthand:

$$\sum_{k=1}^{45} (k^k - 3k) = \underset{-2}{(1^1 - 3 \cdot 1)} + \underset{-2}{(2^2 - 3 \cdot 2)} + \underset{18}{(3^3 - 3 \cdot 3)}$$

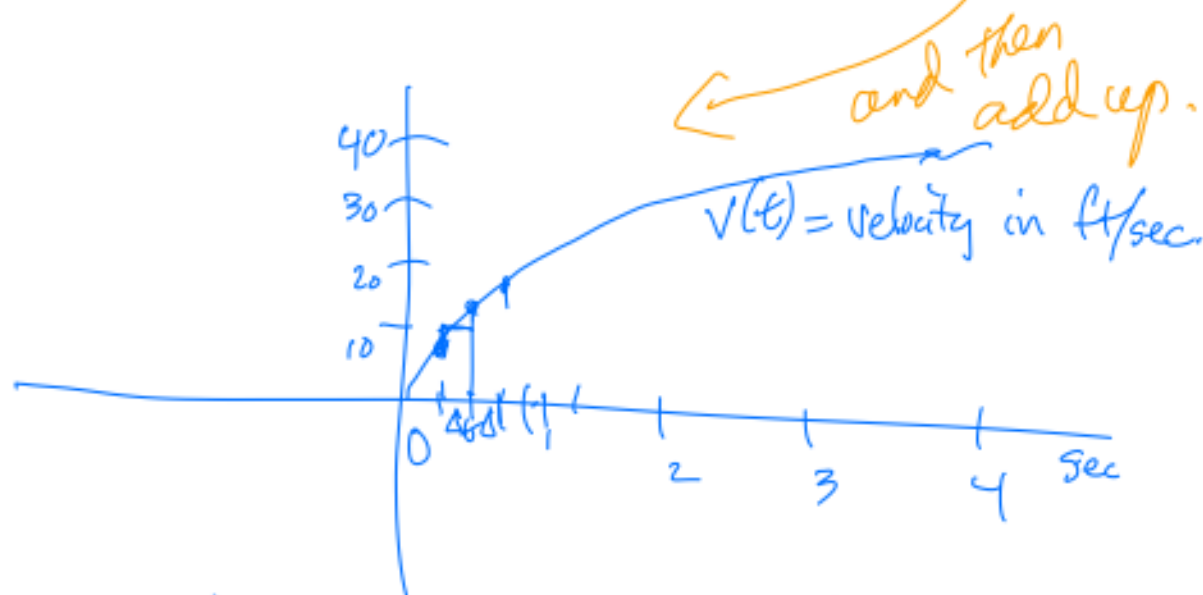
$$+ \left(4^4 - 3.4 \right) + \dots + \left(45^{45} - 3.45 \right)$$

256 - 12
244

$$\text{distance} = (\text{speed}) \cdot (\text{time})$$

$$\text{revenue (sales)} = (\text{price per item}) (\# \text{ of items sold})$$

Many different formulas involve multiplying 2 things.



$$\text{Distance travelled} = \text{velocity} \cdot \text{time}$$

$$= \text{sum of } \text{velocity}(t) \cdot \Delta t$$

$$\text{total distance travelled} = \sum v(t) \Delta t$$

Math example: if $V(t) = t^2$, $0 \leq t \leq 1$
 What is distance traveled, approximately?

$$V(t) = 0 \quad .01 \quad (.1)^2 \quad (.2)^2 \quad (.3)^2$$

t 0 .1 .2 .3 .4 .5 .6 .7 .8 .9 1

Total distance = $\sum_{i=1}^n V(t_i) \Delta t$

$$= (.1)^2(.1) + (.2)^2(.1) + (.3)^2(.1) + \dots + (1)^2(.1)$$

$$= \sum_{m=1}^{10} \left(\frac{0.1m}{10} \right)^2 (.1)$$