

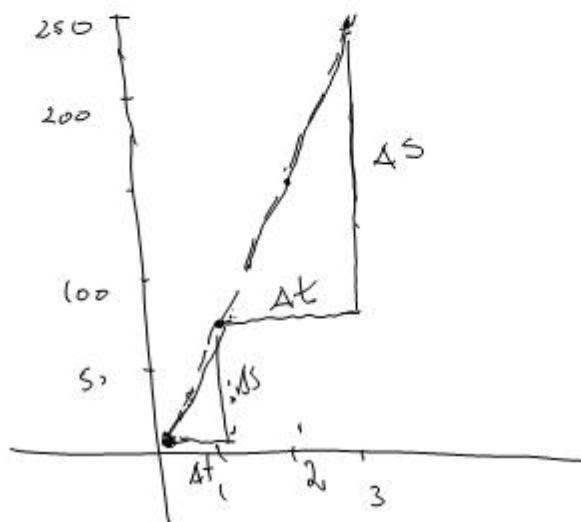
Gjennomsnittlig vekthastighet = Gjennomsnittstort

Fra $t=0$ til $t=1$: $t=0$ $t=1$
 $s=0$ $s=70$

$$\frac{\Delta s}{\Delta t} = \frac{s(1) - s(0)}{1 - 0} = \frac{70 - 0}{1 - 0} = \underline{70 \text{ km/t}}$$

Fra $t=1$ til $t=3$:

$$\frac{\Delta s}{\Delta t} = \frac{s(3) - s(1)}{3 - 1} = \frac{230 - 70}{3 - 1} = \underline{80 \text{ km/t}}$$



Momentan vekthastighet = Momentan

momentan fart

Hva er farten i $t=2$?

$$\underline{t=2}: \quad s(2) = 147$$

$$\underline{t=2+\Delta t}: \quad s(2+\Delta t) =$$

$$\underline{\Delta t=0.1}: \quad t=2.1 \quad s(2.1) = 159.5$$

$$\frac{\Delta s}{\Delta t} = \frac{159.5 - 147}{2.1 - 2} = \frac{12.5}{0.1} = \underline{125 \text{ km/t}}$$

Definisjon: Momentan veløshastighet for s i $t=2$

$$s'(2) = \lim_{\Delta t \rightarrow 0} \frac{s(2+\Delta t) - s(2)}{(2+\Delta t) - 2}$$

$$= \lim_{\Delta t \rightarrow 0} \frac{s(2+\Delta t) - s(2)}{\Delta t}$$

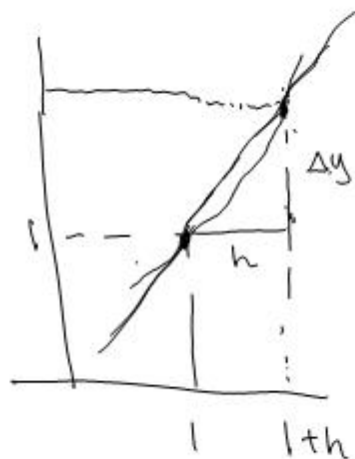
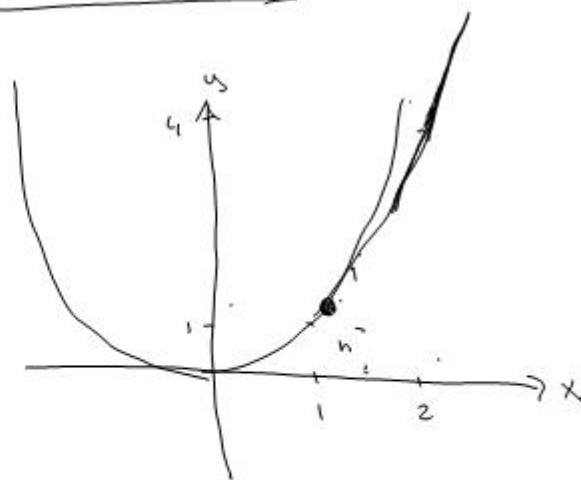
$$= \lim_{h \rightarrow 0} \frac{s(2+h) - s(2)}{h}$$

Gitt en funksjon $y = f(x)$ og et punkt $x = a$.

Momentan vedst hastegheter til f i $x = a$:

$$f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

Ekse: $f(x) = x^2$
 $a = 1$
 $f'(1) = ?$



$$\begin{aligned} \Delta y &= f(1+h) - f(1) \\ &= (1+h)^2 - 1^2 \\ &= 1 + 2h + h^2 - 1 \\ &= \underline{2h + h^2} \end{aligned}$$

$$\begin{aligned} \frac{\Delta y}{\Delta x} &= \frac{2h + h^2}{h} \\ &= \frac{\cancel{x}(2+h)}{\cancel{x}} \\ &= \underline{2+h} \end{aligned}$$

$$\begin{aligned} f'(1) &= \lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h} \\ &= \lim_{h \rightarrow 0} (2+h) = 2 \end{aligned}$$