2014 konte

$$\int_0^{x^2} \frac{\sqrt{t}\, e^{t} \, dt}{x} \overset{L'H}{=}$$

Mest sannsynlig analysens fundamental teorem

8.3.1 Anta at $f:[a,b] \to \mathbb{R}$, og kontinuerlig

da er f integrerbar på $[a,x]$,

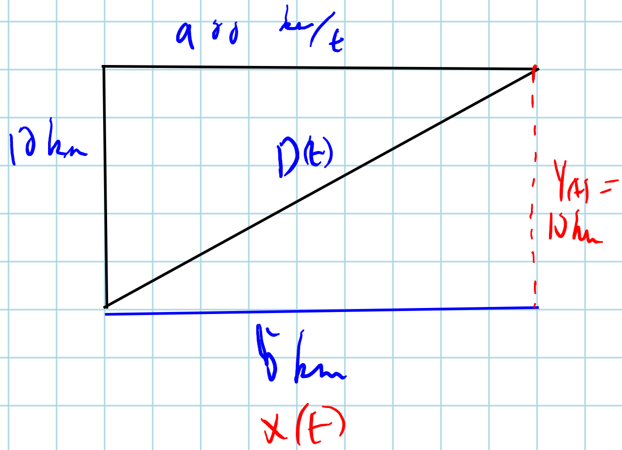
$a \le x \le b$ og $F(x) = \int_a^x f(t)$ . . .

$$F(x) = \int_a^{g(x)} f(t)\, dt$$

$$F'(x) = f(g(x)) \cdot g'(x)$$

$$\lim_{x\to 0} \int_0^{x^2} \frac{\sqrt{t}\, e^{t}\, dt}{x^3} = \lim_{x\to 0} \frac{\sqrt{2}\, e^{x^2}\, 2x}{3x^2} = \lim_{x\to 0} \frac{2e^{x^2}}{3} = \frac{2}{3}$$

Konte 2016



Hva er $D'(t_0)$ når $D(t_0)$ er

når det flyet er 5 km

unna fyret, målt langs bakken

$$D(t)^2 = 10^2 + (x(t))^2$$

$$2D(t) \cdot D'(t) = 2x(t) \cdot x'(t)$$

Vet at $x'(t) = 900$ km/t

$x(t_0) = 5$ km

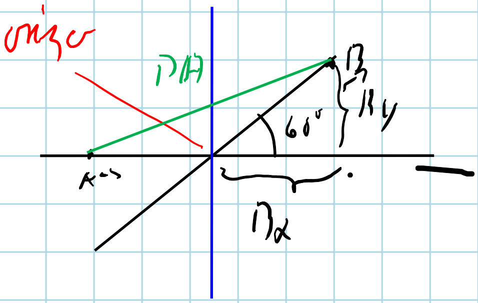
$D(t_0) = \sqrt{10^2 + 5^2}$

$= 5\sqrt{5}$

$$D'(t_0) = \frac{2x(t_0)\, x'(t_0)}{2D(t_0)}$$

$$= \frac{\cancel{5} \cdot 900}{\cancel{5}\sqrt{5}} = \frac{900}{\sqrt{5}} \text{ km/t}$$

Prøve eksa ⑦



$A'(t) = -80$ km/t
$B'(t) = 70$ km/t } strekningen fra krysset

$\cos 60° = \frac{B_x(t)}{B(t)}$

$\sin 60° = \frac{B_y}{B(t)}$

Skal finne $D'(t_0)$ når:

$A(t_0) = 3$

$B(t_0) = 5$

$D(t_0) = \sqrt{(3 + \frac{1}{2}\cdot 5)^2 + (\frac{3}{4}\cdot 5^2)}$
$= 7$

$D(t) = (A(t) + B_x(t))^2 + B_y(t)^2$

$= (A(t) + \frac{1}{2}B(t))^2 + (\frac{\sqrt{3}}{2}B(t))^2$

$2D(t)D'(t) = 2(A(t) + \frac{1}{2}B(t))(A'(t) + \frac{1}{2}B'(t)) + \frac{3}{4}B(t)B'(t)$

$= 2(3 + \frac{1}{2}\cdot 5)(-80 + \frac{1}{2}\cdot 70) + \frac{3}{4}\cdot 5 \cdot 70$

$D'(t) = \frac{15}{7}$ km/t