

p. 416 # 7  $y = \int_0^x \tan t dt$

FTC #1  
 $\frac{d}{dx} \int_a^x f(t) dt = f(x)$

$0 \leq x \leq \frac{\pi}{6}$

$\frac{dy}{dx} = \frac{d}{dx} \int_0^x \tan t dt$

$= \tan x$

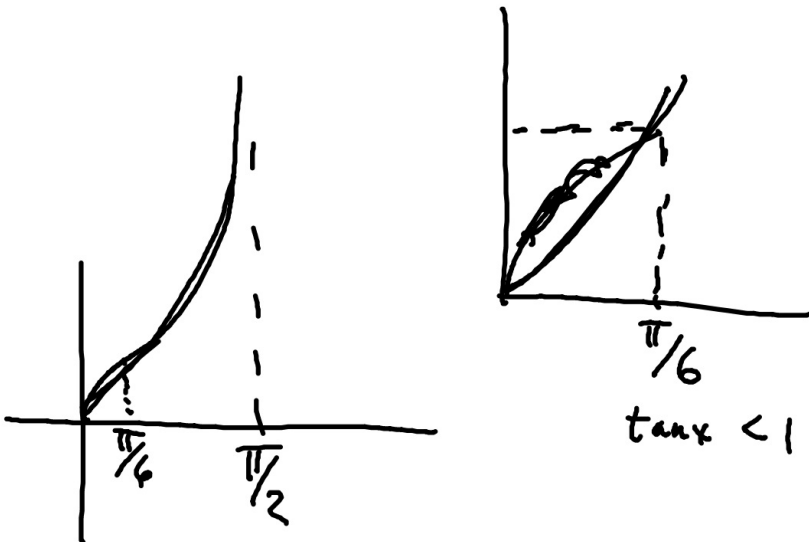
(a)  $L = \int_0^{\pi/6} \sqrt{1 + \tan^2 x} dx$

$\int_0^x \tan t dt$

increasing  
fcn.

(b) ?  $\swarrow$  increasing  
fcn

(c) .549



# MC problems - linear motion

2008 AB7 given  $v(t)$

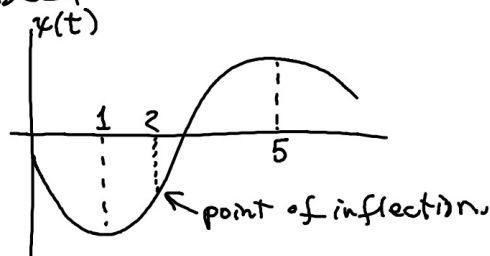
given  $x(0) \leftarrow I.C.$

want  $x(1)$

velocity is the derivative of  
position

position is the antiderivative  
of velocity

2008 AB24/BC21



$x(t)$  decreasing on  $(0, 1)$

when is  $v(t)$  increasing?

point of inflection: change in  
concavity, from up to down

Mo: "I know that  $f(x)$  is concave up  
@  $t=1$  because 2<sup>nd</sup> (accel.)  
derivative is positive."

Me: "I know that velocity is  
increasing because acceleration  
(2<sup>nd</sup> derivative) is positive."

2008 AB 82

need to find derivative of  
velocity @  $t=3$

2008 BC 85 how many times  
does particle change directions?

graph  $v(t)$  on  $[-3, 3]$

look for: crossings of  $t$ -axis

AP Test: # 1-28 no calc.

MC #76-92 calc.