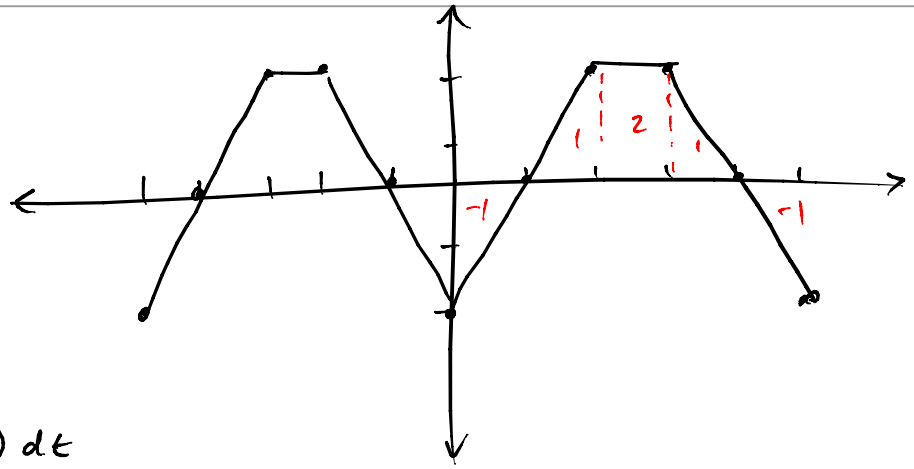
# #3

Note Title 10/4/2011




$$g(x) = \int_0^x f(t)\,dt$$

(a) $g(4) = \int_0^4 f(t)\,dt = \boxed{3}$

$g'(4) = f(4) = \boxed{0}$

$g''(4) =$ slope of $f$ at $x=4$ $= \boxed{-2}$

(b) $g$ has a relative minimum at $x = 1$

$g(1)$ exists

$g'(1) = 0$

$g'$ changes from $-$ to $+$ at $x = 1$.

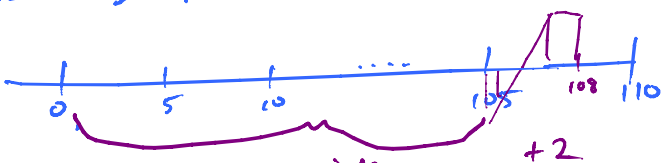
(c) $g(10) = g(5) + \int_5^{10} f(t)\,dt$

$2 + 2 = \boxed{4}$

Tangent line: need point and slope

point: $g(108)$ .... hmmm, every 5 units travelled on $x$ means 1 recycles.

so every period of 5 on $x$ = an area of 2 on $g$.




21 periods
× 2 area
42

+2 = 44

pt = (108, 44)

slope = $g'(108) = f(108)$.

$f(108)$ is the same as $f(5)$ due the periodic nature of $f$.

so $f(108) = 2 = g'(108)$

$$y - y_1 = m(x - x_1)$$

$$\boxed{y - 44 = 2(x - 108)}$$

or

$$\boxed{y = 2x - 172}$$