LAST DAY OF OUR CHAPTER FOUR REVIEW

$$\int_3^7 F'(5x)\,dx$$

$u = 5x$

$du = 5\,dx$

$\frac{1}{5}du = dx$

$u(3) = 15$

$u(7) = 35$

$$= \frac{1}{5}\int_{15}^{35} F'(u)\,du$$

$$= \frac{1}{5}\left[F(35) - F(15)\right]$$

$$\int_0^{\frac{\pi}{4}} \sec\theta\tan\theta\,d\theta$$

$$= \sec\theta \Big|_0^{\frac{\pi}{4}}$$

$$= \sec\frac{\pi}{4} - \sec 0$$

$$= \sqrt{2} - 1$$

$$\int_0^{\sqrt{3}} \frac{2x}{\sqrt{1+x^2}}\,dx$$

$u = 1 + x^2$

$du = 2x\,dx$

$u(0) = 1$

$u(\sqrt{3}) = 4$

$$= \int_1^4 u^{-\frac{1}{2}}\,du$$

$$= 2\sqrt{u}\Big|_1^4 = 2\sqrt{4} - 2\sqrt{1}$$

$$= 2$$

t seconds	0	1	4	5	10
$v(t)$ m per sec	2	4	-1	-2	4

CLUE: $x(0) = 10m$

The velocity of a particle moving along the x-axis is modeled by a differentiable function v, where the position x is measured in meters, and time t is measured in seconds. Selected values of $v(t)$ are given in the table above. The particle is at position $x = 10m$ at time $t = 0$

(a) Estimate the acceleration of the particle at time $t = 3$

$a(t) = v'(t)$

$a(3) \approx \frac{v(4) - v(1)}{4-1} = \frac{-1-4}{3} = \frac{-5}{3} \frac{m}{sec^2}$

(b) Write [but do not solve] an integral expression to find the position of the particle at time $t = 10$ seconds

Remember $x(t)$ is the position at time t

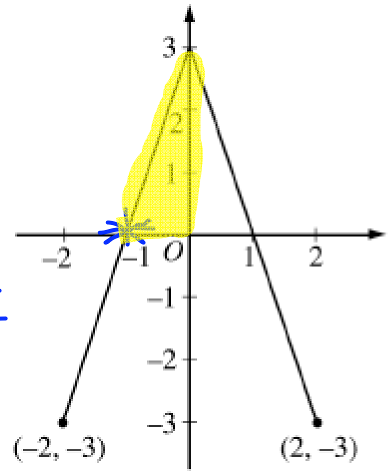
$x(10) = x(0) + \int_0^{10} v(t)\,dt$

$v(t) = x'(t)$

$$g(-1) = \int_0^{-1} f(t)\,dt$$

$$= -\int_{-1}^{0} f(t)\,dt$$

$$= -1.5$$



Graph of f, or $g'(x)$

$$g''(x) = f'(x)$$

$$g''(-1) = f'(-1)$$

$$g''(-1) = 3$$

The graph of the function f shown above consists of two line segments. Let g be the function given by

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

Find $g(-1)$, $g'(-1)$, $g''(-1)$

$$g'(x) = \frac{d}{dx}\int_0^x f(t)\,dt = f(x)$$

$$g'(-1) = f(-1) = 0$$