14. Compute $\int_C 2x\,dx - y^3\,dy$ where C is the line segment from $(1,2)$ to $(5,4)$.

slope $\frac{1}{2}$

$y-2=\frac{1}{2}(x-1)$

$2y-4=x-1$

Let $x=t$

$y=\frac{t}{2}+\frac{3}{2}$

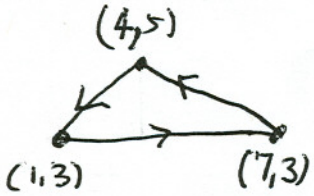
$1\le t\le 5$

$$\text{ans}=\int_1^5\left[2t-\left(\frac{t}{2}+\frac{3}{2}\right)^3\frac{1}{2}\right]dt$$

$$=\left.t^2-\frac{\left(\frac{t}{2}+\frac{3}{2}\right)^4}{4}\right]_1^5$$

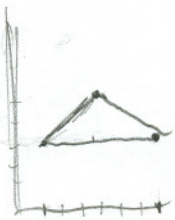
$$=25-\frac{(4)^4}{4}-1+\frac{(2)^4}{4}$$

15. Compute $\int_C 2y\,dx - 5x\,dy$ where C consists of three line segments. The first line segment for C starts at $(1,3)$ and goes to $(7,3)$; the second segment is from $(7,3)$ to $(4,5)$; and the third segment is from $(4,5)$ to $(1,3)$.



Use Green's Thm $\text{ans}=\iint_{\text{region}} N_x - M_y\,dA$

$=\iint_{\text{region}}(5-2)\,dA = -7$ area of region



$=-7\left(\frac{1}{2}\right)$ base ht $=-7\left(\frac{1}{2}\right)(6)2=-42$