

Panel 1

Complex Homework #15

(1) Let C be the boundary of the square with sides at $x = \pm 2$ and $y = \pm 2$. Compute,

a) $\int_C \frac{e^{-z}}{z - \frac{\pi i}{2}} dz$

b) $\int_C \frac{z}{2z+1} dz$

b) $\int_C \frac{\cosh(z)}{z^4} dz$

d) $\int_C \frac{z}{z^2-1} dz$ ← hint: PFD

(2) Consider $\int_{\gamma} \frac{z^2+1}{(z+2)^2(z-4)} dz$. Evaluate

for
 (a) γ is $|z|=1$, (b) γ is $|z|=3$, (c) γ is $|z|=5$

Panel 2

(2) Let $g(z) = \int_C \frac{s^3 + 2s}{(s-z)^3} ds$ where C is

a simple, closed curve. Show that $g(z) = 6\pi i z$

for all z inside C and $g(z) = 0$ for

all z outside C .

(3) Memorize the "How-to" theorem, the "Cauchy-Goursat" theorem, the "Deformation" theorem, and "Cauchy Int. Formula" as the "General Cauchy Int. Formula".