Math 403, section 1

A few integrals

March 27, 2002

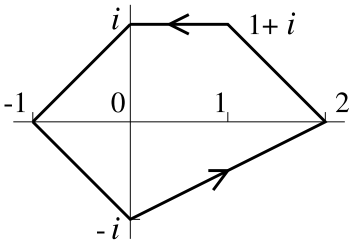
Name ______________________________

You may use any theorem you like!

Suppose $f(z) = \dfrac{e^z}{z(z-3)^2}$.

Problem #1

Compute the integral $\displaystyle\int_\alpha f(z)\,dz$ where α is the closed curve shown: line segments from 2 to $1+i$ to i to -1 to $-i$ to 2.

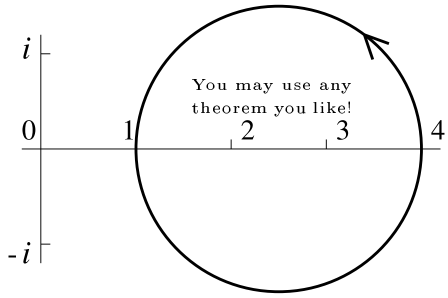


Answer ______________

You may use any theorem you like!

Problem #2

Compute the integral $\displaystyle\int_\beta f(z)\,dz$ where β is the closed curve shown: a circle of radius $\frac{3}{2}$ centered at $\frac{5}{2}$.



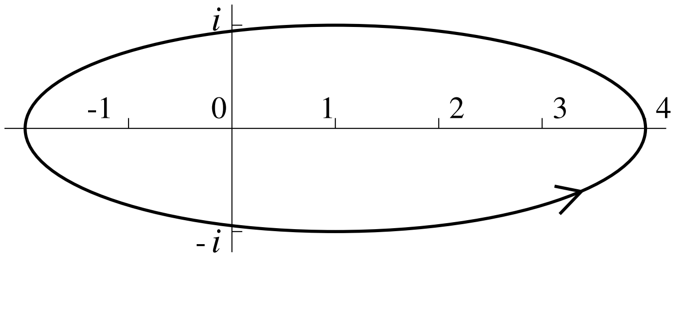
You may use any theorem you like!

Answer ______________

Problem #3

You may use any theorem you like!

Compute the integral $\displaystyle\int_\gamma f(z)\,dz$ where γ is the closed curve shown: a ellipse centered at 1 with axes parallel to the coordinate axes, with vertical semiminor axis of length 1 and horizontal semimajor axis of length 2.



Answer ______________