Cauchy's Theorem- HW Problems

1. Evaluate $\oint_C \frac{2}{z(z+2)}dz$ where C is the circle $|z| = 1$.

2. Evaluate $\oint_C \frac{e^{(z^2)}}{z^7}dz$ where C is

a. The circle $|z| = 1$

b. The circle of radius 1 centered at $z = -2$ given by $|z + 2| = 1$.

c. The circle of radius 2 centered at $z = -1$ given by $|z + 1| = 2$.

3. Evaluate $\oint_C \frac{e^{(z^2)}}{z(z+2)}dz$ where C is the circle $|z| = 1$.

4. Evaluate $\oint_C f(z)dz$ where C is the circle $|z| = 1$ and

a. $f(z) = \frac{1}{z^2-9}$

b. $f(z) = \frac{1}{z-\frac{1}{4}}$

c. $f(z) = e^z$

5. Evaluate $\oint_C f(z)dz$ where C is a simple closed curve where $z = 0$ is inside of C and

a. $f(z) = \frac{e^{(z+1)}}{z^5}$

b. $f(z) = \frac{e^{(z^2+1)}}{z^4}$

6. Evaluate $\oint_C \frac{e^{(z^2)}}{(z+1)}dz$ where C is is a simple closed curve and $z = -1$ is inside of C.