

MATH 115 Problem Set 2

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1. What is the value of

$$\oint_C \frac{z+4}{z^2+2z+5} dz$$

(a) if C is the circle $|z|=1$? (b) if C is the circle $|z+1-i|=2$? (c) if C is the circle $|z+1+i|=2$?

2. What is the value of

$$\oint_C \frac{e^z}{(z+1)^2} dz$$

around the circle $|z-1|=3$?

3. What is the value of

$$\oint \frac{z+1}{z^3-2z^2} dz$$

(a) if C is the circle $|z|=1$? (b) if C is the circle $|z-2-i|=2$? (c) if C is the circle $|z-1-2i|=2$?

4. Find the value of the closed loop integral

$$\oint \frac{z^3 + \sin z}{(z-i)^3} dz$$

taken around the boundary of the triangle with vertices at $\pm 2, 2i$.

5. What is the value of

$$\oint_C \frac{\tan z}{z^2} dz$$

if C is the circle $|z|=1$?

6. What is the value of

$$\oint_C \frac{\ln z}{(z-2)^2} dz$$

if C is the circle $|z-3|=2$?