Complex Variables – HW 7 – question 11

First just use z^5 to find wrapping number |z|<2

```
sol = Solve[2 z^5 == 0 && Norm[z] < 2, z]
```

$$\{\{z \to 0\}, \{z \to 0\}, \{z \to 0\}, \{z \to 0\}, \{z \to 0\}\}$$

```
preImages = z /. sol
```

$$\{0, 0, 0, 0, 0\}$$

```
wrappingNumber = Length[preImages]
```

$$5$$

Don't really understand how to do it like the book says. I can do it pretty easily just with an innequality

```
sol = Solve[2 z^5 + 8 z - 1 == 0 && 1 < Norm[z] < 2, z]
```

$$\{\{z \to \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 2]\}, \{z \to \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 3]\},$$
$$\{z \to \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 4]\}, \{z \to \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 5]\}\}$$

```
preImages = z /. sol
```

$$\{\text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 2], \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 3],$$
$$\text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 4], \text{Root}[-1 + 8\,\#1 + 2\,\#1^5 \&, 5]\}$$

```
wrappingNumber = Length[preImages]
```

$$4$$