

Problem 5- Find Generators for Z-star 13

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```
[1]: n = 13
Z_star_13 = [2,3,4,5,6,7,8,9,10,11,12]
phi_13 = 12
# should have phi_12 = 4 generators
```

```
[2]: def is_val_generator(x, n, order):
    for i in range(1,order+1):
        if x**i % n == 1:
            if i == order: # is a generator
                return True
            elif i < order:
                return False
    return False
```

```
[3]: gens = []
for val in Z_star_13:
    if is_val_generator(val, n, phi_13):
        gens.append(val)

print(gens)
```

```
[2, 6, 7, 11]
```

```
[ ]:
```