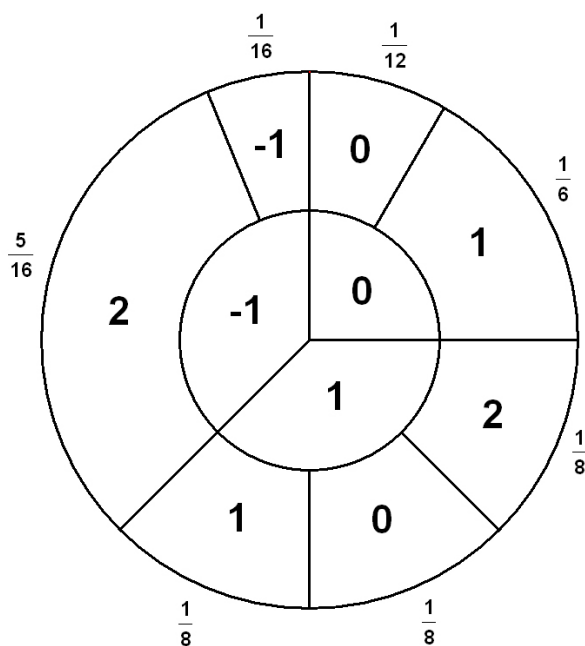


1. Suppose  $d = \gcd(47124, 44716)$ .
  - (a) Find  $d$
  - (b) Find  $k, l$  such that  $d = 47124 \cdot k + 44716 \cdot l$ .
2. For each of the following find  $a^{-1} \pmod{m}$  or explain why no such inverse exists. That is, find  $c$  such that  $ac \equiv 1 \pmod{m}$ .
  - (a)  $a = 24139, m = 32190$
  - (b)  $a = 21335, m = 2133466$ .
3. Find  $\phi(1683000)$
4. Consider the following wheel:



- Suppose that  $X$  is the average of 10 rolls of the inner wheel,  $Y$  is the average of 20 rolls of the outer wheel, and  $Z$  is the average of 20 rolls of the inner wheel. Find the following:
- (a)  $E(X)$
  - (b)  $E(Y)$
  - (c)  $E(Z)$
  - (d) Which is bigger  $P(X > 0.5)$  or  $P(Z > 0.5)$ ? Explain.
5. Find the following places on campus and take a picture of yourself there and send it to me.
    - (a) The Counseling Center.
    - (b) The International Center.