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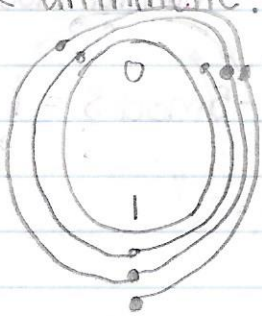
Section W02

CIS405: Mod 4 Modular Arithmetic Journal 9/3

Visualize 7 mod 2 and -7 mod 6 using clock arithmetic and Barrett reduction. Show the calculation on how you arrived at the answer in both cases.

Clock arithmetic: 7 mod 2



7 mod 2 = 1

Barrett Reduction: 7 mod 2 (a = 7, m = 2)

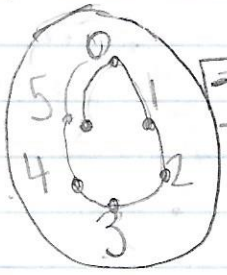
$= 7 - 2 \cdot \lfloor 7/2 \rfloor \rightarrow 7 - 2 \cdot \lfloor 3.5 \rfloor$

$= 7 - 2 \cdot 3$

$= 7 - 6 = 1$

7 mod 2 = 1

Clock arithmetic: -7 mod 6



-7 mod 6 = 5

Barrett Reduction: -7 mod 6 (a = -7, m = 6)

$= -7 + (6 \cdot \lfloor 7/6 \rfloor)$

$= -7 - [6 \cdot \lfloor -1.16 \rfloor)$

$= -7 - (6(-2))$

$= -7 - (-12)$

$= -7 + 12 = 5$

-7 mod 6 = 5