

# Are We There Yet?

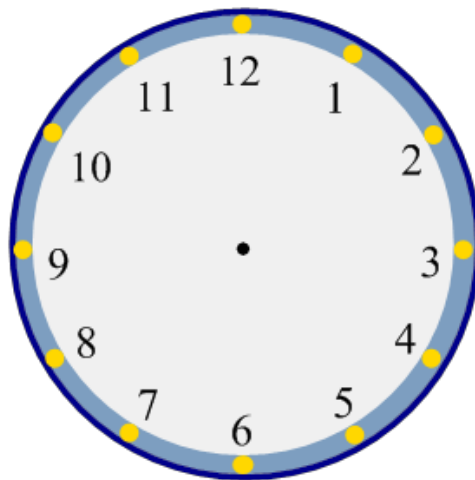
Name:

Date:

## Directions

You will be presented with two problems relating to clocks and time. In each problem, begin at 12 o'clock and move in the clockwise direction. The "step" will tell you **exactly** how many hours you can move at one time. Move around the clock multiple times using the two different steps. Once you are familiar with the process try to answer the questions. Have fun!

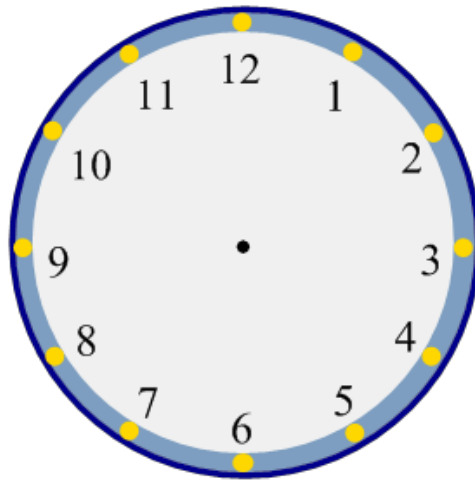
## Problem 1



### Step: 3 hours

- (1) Visually represent at least 10 steps around the clock. (Graph?)
- (2) What is the least number of steps to return to 12 o'clock? Explain.
- (3) Can you reach every number on the clock? Explain.
- (4) Predict at which number you will end after 25, 44, 100, 36000 steps? Explain.

## Problem 2



### Step: 5 hours

- (1) Visually represent at least 10 steps around the clock. (Graph?)
- (2) What is the least number of steps in order to return to 12 o'clock? Explain
- (3) Can you reach every number on the clock? Explain.
- (4) Predict at which number you will end after 25, 44, 84, 48000 steps? Explain.

## Bonus Questions

- (A) Relate question (3) in both problems to how the step divides 12. If the step is equal to 8, will you reach every number on the clock? Explain.
- (B) Come up with an equation for the ending position,  $E$ , given a starting position,  $S$ , and a number of hours passed,  $H$ . Can you include the division algorithm somewhere in your equation? Explain.
- (C) Define a number system that relates to these clock problems. Can you define any binary operations on your number system? Explain.