1. [9 points] The function $h(r)$ is **even** and **periodic** with period 6. Some values of $h(r)$ are given in the table below.

r	-2	0	1	3
$h(r)$	1.5	1	0	-1

The function $f(x)$ is given by $f(x) = \log(3x)$.

a. [5 points] Evaluate each of the following using information you know about $h(r)$; or if there is not enough information to so so, write NEI. *Write your answer in exact form, or rounded to two decimal places. Where relevant, show all work.*

(i.) $h(2) =$ 1.5

Solution: Because $h(r)$ is an even function, $h(2) = h(-2) = 1.5$.

(ii.) $h(h(0)) =$ $h(1) = 0$

(iii.) $h(10) =$ 1.5

Solution: Because $h(r)$ is a periodic function with period 6, $h(10) = h(10-12) = h(-2) = 1.5$.

(iv.) $f^{-1}(h(-2)) =$ $\frac{10^{1.5}}{3} \approx 10.541$

Solution: Since $h(-2) = 1.5$, we need to fine $f^{-1}(1.5)$. This is the same as solving for the x such that $f(x) = 1.5$.

$$\log(3x) = 1.5$$
$$3x = 10^{1.5}$$
$$x = \frac{10^{1.5}}{3}$$

b. [2 points] Is $h(t)$ invertible? Explain why it definitely is, why it definitely isn't, or if there isn't enough information to tell.

Solution: If $h(r)$ is even, then so is $h(t)$— the input variable doesn't change that. Thus $h(2) = h(-2)$. This means it doesn't pass the horizontal line test, and thus is not invertible.

c. [2 points] Without using a calculator, Laurel claims that $f(33)$ is approximately 2. Explain how she could have known this!

Solution: $f(33) = \log(3 \cdot 33) = \log(99) \approx \log(100) = 2$.