

## Math 1165: Homework

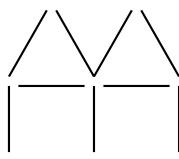
### Due: Friday, October 26th

1) A baby blue whale weighs 303.89 pounds 3.5 months after birth and 476.78 pounds on its first birthday. Assuming that the weight of the whale grows at a constant rate,

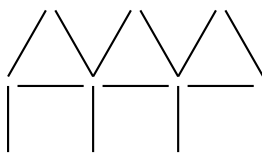
- Make a graph showing the relationship of the weight to the age of the whale. Put the age (in months) on the  $x$ -axis, and the weight on the  $y$ -axis.
- Connecting the dots from the first part, you should get a line. What is the slope of the line and what does it represent in the story and what is the unit for the slope?
- Without finding the whale's birth weight, predict (using arithmetic!) how much the whale weighs 6.78 months after birth.
- Without finding the whale's birth weight, predict (using arithmetic!) when will the whale weigh 1000 pounds.
- Write an equation describing the relationship between the weight and the age of the whale. Again, do this without finding the whale's birth weight.
- Find the  $y$ -intercept of the line. What does it represent in the story?
- Find the  $x$ -intercept of the line. What does it represent in the story?

In each case, explain your reasoning.

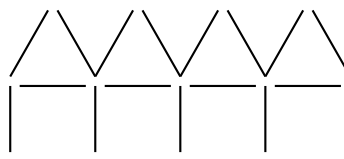
2) Below, we are given a sequence of "rowhouses" made by toothpicks:



Rowhouse 1



Rowhouse 2



Rowhouse 3

- How many toothpicks will it take to make rowhouse 0? How many toothpicks will it take to make rowhouse 5?
- Give an algebraic expression for the number of toothpicks in rowhouse  $n$ .

- (c) Give a pictorial argument explaining why your expression is valid for **any** numbered rowhouse.

In each case, explain your reasoning.

- 3)** Considering the rowhouses from the problem above, what is the total number of toothpicks will it take to make all the rowhouses starting with rowhouse 1 and going to rowhouse 128? Explain your reasoning.