

Mathematics 172 Homework

We decided in class that if two organisms have the same shape, then their weights are proportional to the cube of their lengths. Or if height is a more appropriate measure than length, then the weight is proportional to the height cubed. Using this do the following:

1. Assume that a 4 foot boa constructor weights 10 pounds.

(a) Give a formula for the weight, w , of a boa in terms of its length L .
Answer: $w = .15625L^3$ pounds.

(b) What is the predicted weight of a 10 foot boa? *Answer:* 166.25 pounds.

2. Assume pine tree that is 3 meters tall weighs 4kg.

(a) Give a formula for the weight, w , of a pine tree in terms of its height h . *Answer:* $w = .148h^3$ pounds.

(b) What is the weight of a pine that is 25 meters tall? *Answer:* 2314kg.

3. A 20 foot great white shark weights 5,000 pounds. A great white shark can be as long as 5 feet at birth. Use this data to estimate the weight of a 5 foot great white shark pup. *Answer:* 78.125 pounds.