Mathematics 172

Quiz 2 **Name:** Key

You must show your work to get full credit.

1. We have two salamanders of the same species. The smaller of the two is 8cm long and the second is 11cm long.

(a) What is the scaling factor, λ, to magnify the first salamander to the size of the second salamander?

$\lambda = \frac{11\text{ cm}}{8\text{ cm}} = 1.375$

$\lambda =$ 1.375

(b) If the smaller salamander weighs 3.2 grams. What is the weight of the second salamander?

Weight scales like λ^3, so the weight is

$W = (1.375)^3 (3.2)$ grams

$= 8.31875$ grams

The weight is 8.319 grams

2. A glacier is sliding down a slope at with a constant acceleration of $a = 4.2\,\text{yards/hour}^2$. What is a in feet/min^2? (Your can use that 1 yard = 3 feet.)

$a = \frac{4.2\text{ yd}}{\text{hr}^2} = 4.2\,\frac{3\text{ ft}}{(60\text{ min})^2}$

$= \frac{(4.2)(3)}{60^2}\,\frac{\text{ft}}{\text{min}^2} = .00358\,\frac{\text{ft}}{\text{min}^2}$

$a =$ .00358 $\frac{\text{ft}}{\text{min}^2}$