

A Colorado Run in Washington? Math in my Life #3

Have you ever been to Boulder? It's is a beautiful place, and the running there is truly awesome. The mountains are a two-minute walk from downtown, and are criss-crossed by miles of beautiful trails. I got so excited about running while I was there that my friends managed to persuade me to sign up for the Pikes Peak Half Marathon near Colorado Springs.

This is no ordinary Half Marathon. A regular Half Marathon is a 13 mile run, often on city streets. This run is 13 miles as usual, but **all uphill**. No kidding. The race starts at an elevation of 6000 feet, and ends at an elevation of 14000 feet. That's like running from Paradise to the top of Mt. Rainier!!!

My friends assured me I could make it to the top - so long as I trained properly. The difficulty was that I moved back to Seattle shortly after signing up for the race. How could I train for a run which *started* at 6000 ft when I lived at *sea level* (0 ft)?!?!? I used a couple of formulas to help me.

First, every 1 foot up is like 10 on the flat (remember that the next time you climb a flight of stairs!!!). So, I had to climb a total of

$$14000 \text{ feet} - 6000 \text{ feet} = 8000 \text{ feet} = \frac{8000}{5280} \text{ miles} = 1.5 \text{ miles.}$$

So, on the flat I needed to be able to run at least ten times the uphill mileage plus the half marathon distance, which is

$$1.5 \times 10 + 13 = 28 \text{ miles!}$$

That formula took care of the "on the flat" mileage. But I also had to do some hill training. The only really good trail I could train on is the one which goes up Mt. Si. I needed to find out how my time on Mt. Si might translate to my time on Pikes Peak. So I compared the mileage traveled and the elevation gain for each mountain:

$$\begin{array}{l} \text{Mt.Si :} \quad \frac{3000 \text{ feet}}{4 \text{ miles}} = 750 \frac{\text{feet}}{\text{mile}} \\ \text{PikesPeak} \quad \frac{8000 \text{ feet}}{13 \text{ miles}} = 615 \frac{\text{feet}}{\text{mile}} . \end{array}$$

So I decided that the two mountains are about the same steepness. Since the Pikes Peak trail is

$$\frac{13 \text{ miles}}{4 \text{ miles}} = 3.25$$

times longer than the Mt. Si trail, multiplying my times up Mt. Si by 3.25 gave me an estimate of the time it would take me to get up Pikes Peak.

In spite of some significant last minute doubts, I actually did fly to Colorado and do the race. It took me 5 hours and 20 minutes to get to the top. If you ask me nicely I'll show you my medal.