

Session 3.1

Mr. Hernandez: josehdz@cs.stanford.edu

Recap of last time

1. If humans who are 6 feet tall need 9 pounds of food, then how much food does a 10 foot giant need?

$$\frac{\text{height}}{\text{food}} = \frac{6}{9} \div 3 \frac{2}{3} \times 5 = \frac{10}{15}$$

2. If Abraham can beat 3 Pokemon gyms in 45 minutes, how much time does he need to beat all 8 Pokemon gyms and reach the elite four?

$$\frac{\text{gyms}}{\text{minutes}} = 345 \div 3 = 115 \times 8 = \frac{8}{120}$$

Main problems

1. Assortment of warm-up problems

- 10 : 14 as 22 : ?
- When Eduardo makes Sencha green tea, he steeps 12 grams of tea in 18 fluid ounces of water. How much water does he need to properly steep 15 grams of tea?
- Suppose Lucio can edit 4 papers in 20 minutes and Mason can edit 6 papers in 35 minutes. How many complete papers can they edit in 45 minutes?
- Suppose Uriel can fix 5 bikes in 3 hours, Denym can fix 2 bikes in one hour, and Corey can fix 7 bikes in 4 hours. How many bikes can they fix per day?

2. Complete the following estimation problems:

- In Chicago, there are 15 ATMs in 4 square miles. How many ATMs would there probably be in 20 square miles? What about 100 square miles?
- If 6 out of 10 American adults have completed college, then how college graduates would you expect in a room full of 80 people?
- Suppose 5000 high school seniors applied to each of the following schools. How many would you expect to be accepted considering the acceptance rate?
 - MIT with 8.9%
 - Harvard with 5.4%
 - 4.8 with 5.4%
- If 5% of people buy a product after seeing many advertisements, then how many of the 100 million viewers of the superbowl will buy a highly publicized product?
- Consider a bag of blue and red jolly ranchers. You grab a handful of 15 candies, 5 red and 10 blue. If there are 150 candies in the bag, how many blue candies do you think are in the bag?
- Suppose we tag 100 buffalo and then release them back into the wild. If we fly a helicopter over their grasslands and 20 out of 100 buffalo we see are tagged, what would you estimate as the size of the buffalo population?
- Suppose we tag 100 buffalo and then release them back into the wild in March. Suppose we tag an additional 50 buffalo in June and release them again. If we fly a helicopter over their grasslands and 20 out of 100 buffalo we see are tagged, what would you estimate as the size of the buffalo population?

Extra problems

1. Problems from 2010 AMC 8