Name: *Caleb McWhorter — Solutions*
MATH 101
Spring 2024
HW 11: Due 03/06

"Wouldst thou like to live deliciously?"
— Satan, The Witch

Problem 1. (10pts) A recipe calls for 2,280 g of flour to bake five loaves of bread.

(a) Using a proportion, find how many grams are required to bake 9 loaves of bread.

(b) How many grams of flour are required per loaf of break—on average?

(c) Use (b) to answer (a).

Solution.

(a) Let x be the number of grams required to make 9 loaves of bread. We have...

$$\frac{2{,}280 \text{ g}}{5 \text{ loaves}} = \frac{x}{9 \text{ loaves}}$$

$$5x = 20{,}520$$

$$x = 4{,}104 \text{ g}$$

(b)

$$\frac{2{,}280 \text{ g}}{5 \text{ loaves}} = 456 \text{ g/loaf}$$

(c)

$$\text{Grams Flour Required} = \text{Grams per loaf} \cdot \#\text{ Loaves} = 456 \text{ g/loaf} \cdot 9 = 4{,}104 \text{ g}$$

Problem 2. (10pts) Showing all your work, answer the following:

(a) A team wins 60 games and loses 20 games, what is the win-loss ratio?

(b) If eight cases of a food costs $55, what should a dozen cases cost?

(c) If it takes 1.5 gallons of paint to cover 580 sq ft, how much paint would be required to cover 2,000 sq ft?

Solution.

(a) The win-loss ratio is $60 : 20$, this is $\frac{60}{20} = 3 = \frac{3}{1}$. Therefore, the win-loss ratio is $3 : 1$.

(b) Let x be the cost of a dozen cases of food. Then...

$$\frac{8 \text{ cases}}{\$55} = \frac{12 \text{ cases}}{x}$$

$$8x = 660$$

$$x = \$82.50$$

Alternatively, the average cost per case is $\frac{\$55}{8} = \$6.875$/case. But then the cost of a dozen cases should be $\$6.875/\text{case} \cdot 12 \text{ cases} = \$82.50$.

(c) Let x be the amount of paint required to cover 2,000 sq ft. Then...

$$\frac{1.5 \text{ gallons}}{580 \text{ sq ft}} = \frac{x}{2{,}000 \text{ sq ft}}$$

$$580x = 3000$$

$$x = 5.17 \text{ gallons}$$

Alternatively, the average amount of area covered per gallon is $\frac{580 \text{ sq ft}}{1.5 \text{ gal}} = 386.667$ sq ft/gal. But then we want the amount of paint, say x, such that $386.667x = 2{,}000$. But then $x \approx 5.17$ gallons.

Problem 3. (10pts) Alexis can prepare 45 candy bags in an hour for a children's party while Casey can prepare 50 candy bags per hour. Working together, how long should it take them to prepare 560 candy bags by working together?

Solution. Let t be the amount of time it takes Alexis and Casey to prepare 560 candy bags working together. Let r_A, r_C, and r_T be the number of candy bags that can be prepared by Alexis, Casey, and Alexis & Casey, respectively. We then have...

$$\text{Total Bags} = \text{Rate} \cdot \text{Time}$$

$$560 = r_T \cdot t$$

$$560 = (r_A + r_C)t$$

$$560 = (45 + 60)t$$

$$560 = 105t$$

$$t = 5.33$$

Therefore, working together, it will take Alexis and Casey 5.33 hours to prepare 560 candy bags, i.e. 5 hours and 20 minutes.