winmath
Career Infused Capstone Projects

Name:

The Power of Food

After observing your first patient, you start seeing other patients with different needs. Answer and explain your solutions to the following questions about your new patients.

Question 1

Patient M is a 65-year-old man who weighs 230 pounds. Over the course of six months, you observe the following changes in his weight.

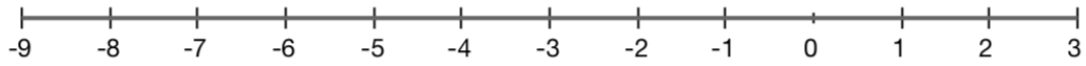
Month	Pounds
1	-5
2	$1\frac{1}{2}$
3	-3
4	1
5	-4
6	$2\frac{1}{4}$

What is the patient's weight at the end of the six months? Show two different ways to find your answer and explain each way.

Question 2

Patient M would like to lose weight. You suggest that it would be healthy for his weight to change anywhere from –8 to 2 pounds per month.

a) Draw a point or marker to the number line below to show what number is halfway between –8 and 2 pounds.



b) How wide is the range for healthy weight change (in pounds) for Patient M? Use mathematical terms to explain how to find the distance between two numbers on a number line.

Question 3

Patient B weighed 151.5 pounds on his first visit to your office. You observed the patient for three years.

- In Year One, the patient's weight changed –4.8 pounds.
- In Year Two, the patient's weight changed –3.2 pounds.
- In Year Three, the patient weighed 151.5 pounds again.

What was the weight change in Year Three? Show or explain how you found the answer.

Question 4

You ask Patient B to weigh himself in the morning and at night. On Tuesday morning, his weight was −0.25 pound less than it was on Monday night. By Tuesday night, his weight rose 0.9 pound since the morning weighing.

Which of the following expressions show the patient's weight change from Monday night to Tuesday night? (Mark all that apply.)

- ☐ −0.25 − 0.9
- ☐ 0.9 + (−0.25)
- ☐ −0.9 − (−0.25)
- ☐ (−0.25) + 0.9

Question 5

Together with Patient B, you develop a new exercise plan that involves running and weight lifting. With this plan, he will burn 1850 calories per week if he exercises every day.

a) How many calories will he burn in one day?

b) If he sticks to the plan, how many calories will he burn in 20 days? Show or explain how you found the answer.

Question 6

After building a model of your bike, you want to have it tested by several different riders. Patient R is a 16-year-old girl who has a dairy allergy. Although she cannot digest dairy products, she must consume 1300 mg of calcium per day.

If her calcium consumption is divided equally across 3 meals, how many milligrams will she need to eat per meal? Give your answer in fraction and decimal form. Show or explain how you found the answer.

Question 7

Patient D suffers bloating and stomach cramps when she eats bread, pasta, or other grains. You suggest she change her consumption of grains by −336 grams per week. If one serving is 16 grams, how many fewer servings of grains will Patient D eat per day? Explain and show how you found your answer.

Question 8

Patient E suffers from cystic fibrosis. One of the symptoms of cystic fibrosis is failure to gain or retain weight, which can be very dangerous for the patient, causing him or her to become sicker and the lung disease to become worse.

Patient E came into your clinic weighing 120 pounds. You observed her for four months.

- The first month, her weight increased 3 pounds.
- The second month, her weight increased half of the amount it increased the previous month.
- In the third month, her weight decreased ½ pound.
- In the last month, her weight decreased twice the amount it decreased the previous month.

What is Patient E's weight at the end of the study? Show or explain how you found the answer.

Question 9

You work with the distance runners on the track and field team at a local college. Part of your job involves recommending a nutritional plan to optimize performance. The athletes usually run between 40 and 50 miles a week and need to make sure they properly fuel their bodies.

During the season, you suggest that the women eat 3000 calories per day. In the off-season, you suggest 2000 calories per day. The number of calories for the in-season diet is how many times the number of calories for the off-season diet? Show or explain how you found the answer.

Question 10

Meal Plan

Patient N is a 150-pound female. She needs a nutritional plan between 1800 and 2200 calories a day. She needs an exercise plan that includes exercising three times a week for at least an hour, changing her calories by –1800 to –2200 calories total.

- Using the information in the Calorie Guide, create an exercise and meal plan for Patient N.
- In your meal plan include at least five items, in which the portion size is scaled up or down by a non-integer factor. (A scaled portion is more or less than the portion indicated on the Calorie Guide.)
- Write the meal and exercise plan in the table to the right. Use only the responses needed to write your plan.
- Use the space below the table to show or explain your work for the items that are scaled.

Food Group	Size	Calories
Fruits		
Avocado	1	160
Banana	1	95
Grapefruit	1	80
Peach	1	40
Pineapple	1 cup	75
Watermelon	1 wedge (10 oz.)	100
Vegetables		
Asparagus	5 spears	20
Broccoli	1	45
Corn	1 stalk	25
Cucumber	1	30
Potato	1	110
Tomato	1	25
Protein		
Turkey	4 ounces	100
Cod	1 filet	90
Egg	1	70
Ground Beef	4 ounces	170
Kidney Beans	$\frac{1}{2}$ cup	80
Salmon	1 filet	200
Dairy		
Butter	1 tablespoon	100
Cheese	1 slice	75
Ice Cream	1 cup	270
Milk (2%)	1 cup	120
Yogurt	1 cup	150
Grains		
Corn Cereal	1 cup	90
Wheat Bread	1 slice	70
White Bread	1 slice	70
Whole Wheat Crackers	5 crackers	85

Exercise	Duration	Calories
Running (8.5 min miles)	$\frac{1}{2}$ hour	–390
Cycling (leisurely)	$\frac{1}{4}$ hour	–70
Yoga	1 hour	–170
Swimming (moderate)	$\frac{1}{3}$ hour	–160
Weight Lifting	$\frac{1}{2}$ hour	–100

Question 10 (continued)

Type of Food	Serving Size	Number of Calories
Breakfast		
Snack		
Lunch		
Snack		
	TOTAL CALORIES:	

b) In the space below, show or explain how you found the number of calories for the items that are scaled.

