Show all your work on a separate sheet of paper. Answer all questions in complete sentences.

You may be asked to find the function rule when given only two sets of data. What are the 3 steps?

Step 1: | **Step 2:** | **Step 3:**

1.   A trainer for a professional football team keeps track of the amount of water players consume throughout practice. The trainer observes that the amount of water consumed is a linear function of the temperature on a given day. The trainer finds that when it is 90°F the players consume about 220 gallons of water, and when it is 76°F the players consume about 178 gallons of water. Write a linear function to model the relationship between gallons (y) of water consumed and temperature (x). How many gallons of water will the team consume when it is 84°F?

2.   The number of dollars per month it costs you to own a car is a function of the number of kilometers per month you drive it. Based on information in an issue of *Time* magazine, the cost varies linearly with the distance, and is $366 per month for 300 km per month, and $510 per month for 1500 km per month. Write a linear function to model the relationship between cost (y) and distance (x). Predict the monthly cost of owning a car if you travel 1,000 km a month.

3.   The size of a shoe a person needs varies linearly with the length of his or her foot. The smallest adult shoe size is Size 5, and fits a 9-inch long foot. An 11-inch long foot takes a Size 11 shoe. Write a linear function to model the relationship between shoe size (y) and foot length (x). If your foot is a foot long what size do you need?

4.   The speed a bullet is traveling depends on the number of feet the bullet has traveled since it left the gun. The bullet is traveling at 3500 ft./sec. when it is 25 feet from the gun, and at 2600 ft./sec., it is 250 feet away. Write a linear function to model the relationship between speed of the bullet (y) and distance from the gun (x). How fast is a bullet when it has reached a distance of 300 ft?

5.   To take a taxi in downtown St. Louis, it will cost you $3.00 to go a mile. After 6 miles, it will cost $5.25. The cost varies linearly with the distance traveled. Write a linear function to model the relationship between cost (y) and distance (x). How much will it cost to travel 10 miles?

6.   Based on information in *Deep River Jim's Wilderness Trailbook*, the rate at which crickets chirp is a linear function of temperature. At 59°F they make 76 chirps per minute, and at 65°F they make 100 chirps per minute. Write a linear function to model the relationship between number of chirps (y) and temperature (x). Predict the number of chirps a cricket will make in a minute if it is 90°F.

7.   The Magic Market sells one-gallon cartons of milk (4 quarts) for $3.09 each and half gallon (2 quarts) cartons for $1.65 each. Assume that the number of cents you pay for a carton of milk
varies linearly with the number of quarts the carton holds. Write a linear function to model the relationship between the price (y) and the number of quarts (x). If Magic Market sells three gallon cartons (remember there are 4 quarts in a gallon), how much will they cost?