Long Term Assignment #4

Period

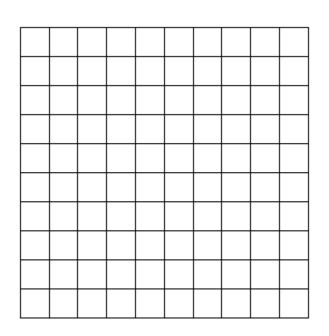
The Olympic record for the men's 400-meter hurdle race is 46.78 seconds. It was set by Kevin Young in 1992. His average running speed was 400 ÷ 46.78 ≈ 8.55 meters per second.

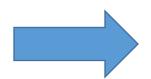
Name

a. Make a table and a graph showing how 400-meter race time changes as average speed increases from 2 meters per second to 10 meters per second in steps of 1 meter per second.



Average Speed	Race Time





b. Describe the pattern of change shown in your table and graph.

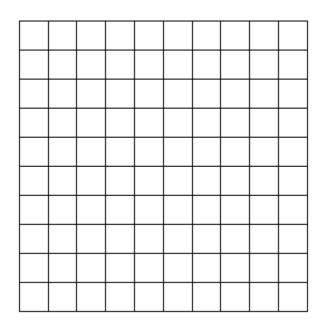
c. Write a rule showing how to calculate race time t for any average speed s.



d. Which change in *average speed* will reduce the *race time* most: an increase from 2 to 4 meters per second or an increase from 8 to 10 meters per second? Explain how your answer is illustrated in the shape of your graph.

- In 2012, the Olympic record in the women's 100-meter freestyle swim race was 53.00 seconds. It was set by Ranomi Kromowidjojo from the Netherlands. She swam at an average speed of $100 \div 53 \approx 1.88$ meters per second.
 - a. Make a table and a graph showing the way average speed for the 100-meter race changes as time increases from 40 seconds to 120 seconds (2 minutes) in steps of 10 seconds.

Average Speed	Race Time



Describe the pattern of change shown in your table and graph.

 ${f c.}$ Write a rule showing how to calculate average speed ${f s}$ for any race time ${f t.}$

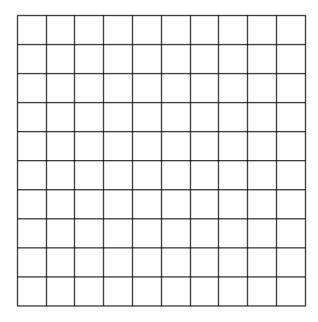
d. Which change in race time will cause the greatest change in average speed: an increase from 50 to 60 seconds or an increase from 110 to 120 seconds? Explain how your answer is illustrated in the shape of your graph. The Water World Amusement Park has a huge swimming pool with a wave machine that makes you feel like you are swimming in an ocean. Unfortunately, the pool is uncovered and unheated, so the temperature forecast for a day affects the number of people who come to Water World.

On a summer day when the forecast called for a high temperature of 90°F, about 3,000 people visited the park. On another day, when the forecast called for a high temperature of 70°F, only 250 people came for the ocean-wave swimming.

a. Complete this table of (temperature forecast, number of swimmers) data in a way that you think shows the likely pattern relating temperature forecast to number of swimmers.

Temperature Forecast (in °F)	70	75	80	85	90	95
Number of Swimmers	250				3,000	

b. Graph the data in Part a. Then draw a line or curve that seems to match the pattern in your data points and could be used to predict number of swimmers at other temperatures.



c. Describe the pattern of change in the *number of swimmers* as the *temperature forecast* increases.

d. Suppose that Water World charges \$15 for admission. Use this information and your estimates for the *number of swimmers* at various *forecast temperatures* to make a table and graph showing the relationship between *forecast high temperature* and *park income*.

Temperature	Income

