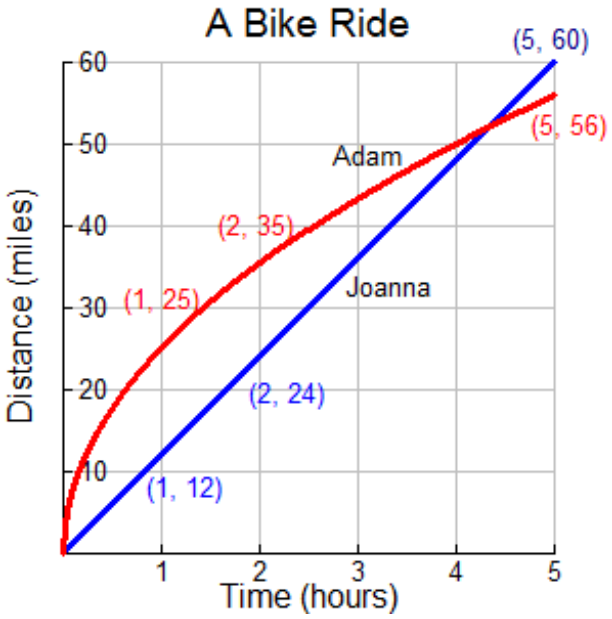
Average Rate of Change

Name_____**Hr**____

1. Adam and Joanna both rode their bikes for five hours last weekend while training for a race. The graph shows their distance traveled over the five hours as a function of time.



a. Describe Joanna's speed during the 5-hour bike ride.

b. Describe Adam's speed during the 5-hour bike ride.

c. Find each rider's average speed over the 5-hour time interval.

d. Who had the fastest average speed?

e. Find each rider's average speed over the interval $[0,1]$

f. Who had the fastest average speed over this interval?

g. Find Adam's average speed over the interval [1, 2].

h. Was Adam traveling faster over the interval [0,1] or [1, 2]?

i. How does the graph show this?

2. An object is dropped from a 256-foot bridge into the water below. The height of this object with respect to time can be modeled by the function $h(t) = -16t^2 + 256$.

a. Use the equation to evaluate the following values of t.

h(0) =

h(1) =

h(2) =

b. Find the average rate of change over the interval [0, 1].

c. Find the average rate of change over the interval [1, 2].

d. Is the object traveling the same speed at every point in its descent? Explain.

e. Explain what is happening to the average rate of change of the object as *t* increases. Why is this happening?

f. If the speed of the object is increasing as it falls, why is the average rate of change negative over the interval?

3. The following tables show the distance traveled by three different cars over five seconds.

Car 1	
Time (s)	Distance (ft)
0	0
1	4
2	7
3	10
4	13
5	16

Car 3	
Time (s)	Distance (ft)
0	0
1	3
2	5
3	9
4	17
5	33

a. Using the above tables, compare the three cars and their positions after *t* seconds. Which car is traveling the fastest? Justify your answer.

b. What is the average rate of change for each car over the interval [0, 2]?

c. What is the average rate of change for each car over the interval [3, 5]?

p

d. Think about it again. Which car is traveling the fastest?