NAME: _____ DATE: _____

Rate of Change

1.

- Remember the formula *distance* = *rate* x *time* or $d = rt$?
- Consider traveling for 4 hours driving 200 miles
  - We can let d = 200 & t = 4, then solve the equation 200 = *r**4 to find that *r* = 50.
- Thus, we say that the average speed for the trip was 50 miles per hour. We'll find more average speeds, or **rates of change**, in this activity.

The data below indicates the time and position of two students racing down the hallway.

Time (sec.)	0	1	2	3	4	5	6	7	8	9	10
Dwain's position (ft.)	0	4	8	12	16	20	24	28	32	36	40
Beth's position (ft.)	0	1	3	6	10	15	20	25	30	35	40

a. Draw a graph for this data. Should you connect the dots? Explain.

b. _____ depends on _____. Thus, _____ is the

independent variable & _____ is the **dependent variable**.

c. Describe how Dwain should walk in order to match his data. In particular, should Dwain's speed be **constant** or changing/**variable**?

d. Describe how Beth should walk in order to match her data. In particular, should Beth's speed be **constant** or changing/**variable**?

To find average speed, or average rate of change, we use our formula, d = rt.

Average Rate of Change = change in distance / change in time

When discussing functions with y depending on x,

Average Rate of Change = change in y / change in x

2. Fill in the table:

t (secs)	1	2	3	4
d(t) = t				

t (secs)	1	2	3	4
$p(t) = t^2$				

a. Find the **rate of change** for d(t) & p(t) for each time interval.
   1 – 2 seconds:

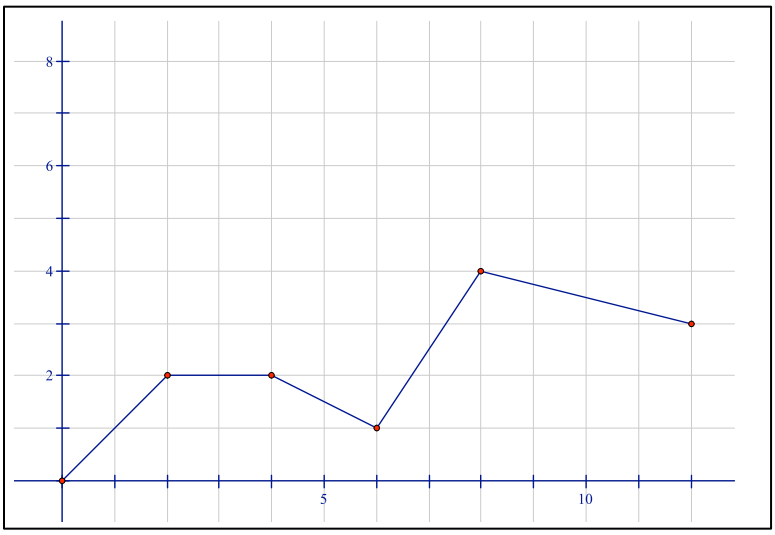
   2 – 3 seconds:

   3 – 4 seconds:

b. What do you notice about the rates of change for the two functions?

c. What is the shape of a graph when the rate of change is constant? variable?

3. Answer the following questions about the graph below.



a. On what intervals is the rate of change positive?
b. On what intervals is the rate of change negative?
c. On what intervals is the rate of change zero?
d. On what interval is the rate of change the largest?
e. On what interval is the rate of change the smallest?