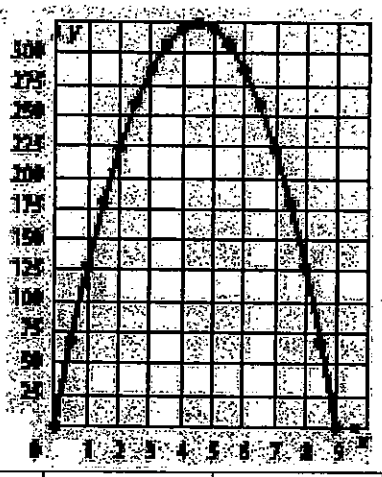
Step 1 Copy the table below.

x	0	0.5	1.0	1.5	...	9.0
y	0					
Rate of Change	–					

Step 2 Find the value of y for each value of x from 0 through 9.

Step 3 Graph the ordered pairs (x, y) on grid paper. Connect the points with a smooth curve. Notice that the function *increases* when $0 < x < 4.5$ and *decreases* when $4.5 < x < 9$.

Step 4 Recall that the *rate of change* is the change in y divided by the change in x. Find the rate of change for each half second interval of x and y.



x											
y											
Rate of Change		( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )
x											
y											
Rate of Change		( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )	( )−( ) / ( )−( )

Exercises

Use the quadratic function $y = x^2$.

1. Make a table, similar to the one in the Activity, for the function using $x = -4, -3, -2, -1, 0, 1, 2, 3$, and 4. Find the values of y for each x-value.
2. Graph the ordered pairs on grid paper. Connect the points with a smooth curve. Describe where the function is increasing and where it is decreasing.
3. Find the rate of change for each column starting with $x = -3$. Compare the rates of change when the function is increasing and when it is decreasing.

x									
y									
Rate of Change		$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$	$\frac{(\ )-(\ )}{(\ )-(\ )}$