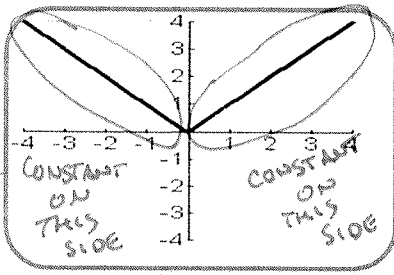


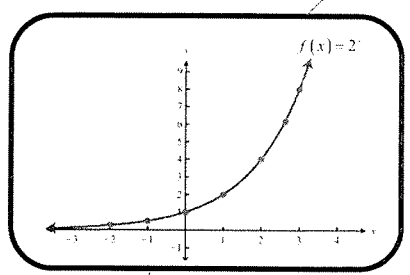
- 1.) What is the average rate of change from O to A?  $\frac{10}{5} = 2$
- 2.) What is the average rate of change from A to B?  $0$
- 3.) What is the average rate of change from B to C?  $-\frac{10}{3} \approx -3.3$
- 4.) What is the average rate of change from C to D?  $0$
- 5.) What is the average rate of change from D to E?  $\frac{5}{5} = 1$
- 6.) What is the average rate of change from E to F?  $0$
- 7.) What is the average rate of change for the whole trip (from O to F)?  $\frac{5}{26} \approx .19$

8.) Use words to describe how Troy is ~~running~~<sup>moving</sup> based on the graph.

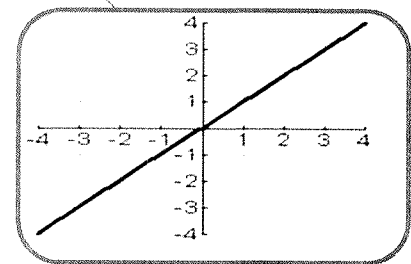
- From 0 to 5 seconds Troy is moving at a rate of 2 ft/sec
- From 5 seconds to 10 seconds he isn't moving
- From 10 seconds to 13 seconds Troy goes back to the original spot at a rate of 3.3 ft/sec
- From 13 seconds to 16 seconds he stays put. (doesn't move)
- From 16 seconds to 21 seconds he moves forward at a rate of 1 ft/sec.
- From 21 seconds to 26 seconds he stands still



OVERALL: CHANGING (VARIABLE)

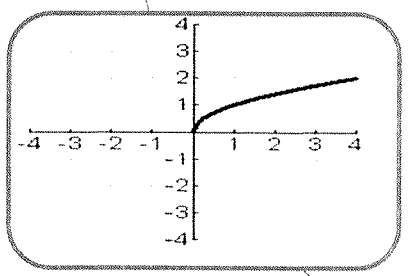


VARIABLE

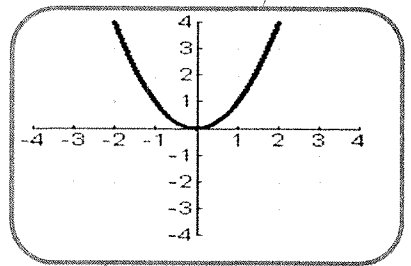


CONSTANT

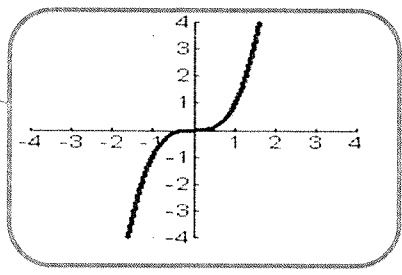
Rates of change:  
Variable or Constant?



VARIABLE



VARIABLE

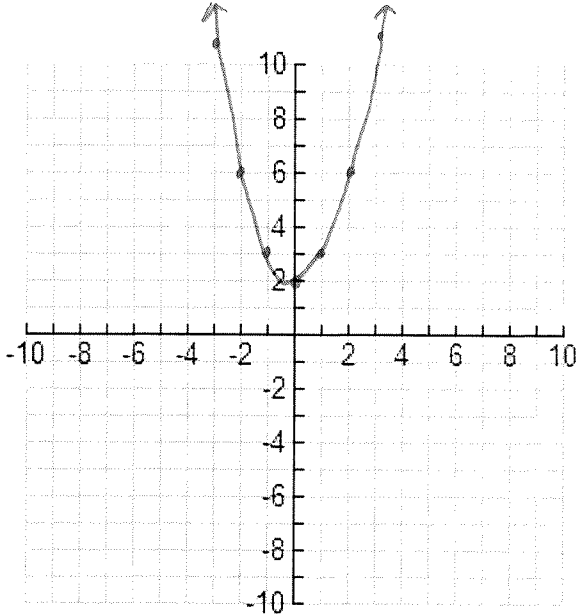


VARIABLE

Complete the table of values. Sketch the function.

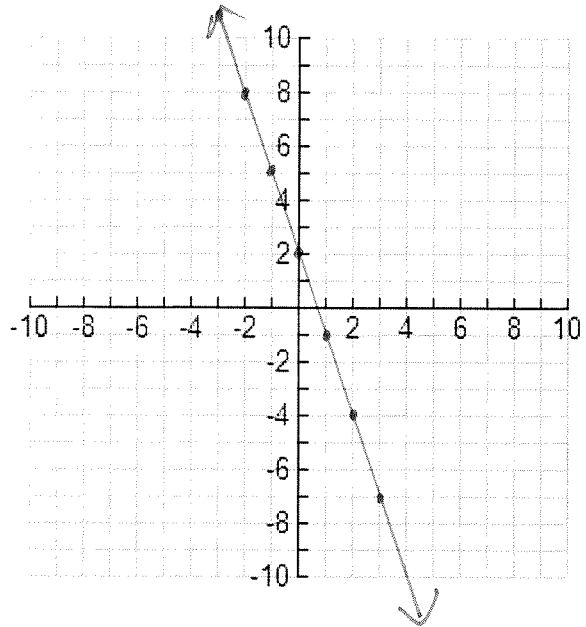
1.  $f(x) = x^2 + 2$

x	-3	-2	-1	0	1	2	3
f(x)	11	6	3	2	3	6	11



2.  $f(x) = -3x + 2$

x	-3	-2	-1	0	1	2	3
f(x)	11	8	5	2	-1	-4	-7



Find the rate of change from:

a.)  $x = -2$  to  $x = -1$   
 $(-2, 6)$   $(-1, 3)$   
 $\frac{6-3}{-2-1} = -1$

USE THE GRAPH AND COUNT OR USE THE SLOPE FORMULA  $\frac{y-y_1}{x-x_1}$

b.)  $x = 0$  to  $x = 2$   
 $(0, 2)$   $(2, 6)$   
 $\frac{2-6}{0-2} = 2$

c.)  $x = -2$  to  $x = 2$   
 $(-2, 6)$   $(2, 6)$   
 $\frac{6-6}{-2-2} = 0$

Find the rate of change from:

d.)  $x = -2$  to  $x = -1$   $(-2, 8)$   $(-1, 5)$   
 $\frac{8-5}{-2-1} = -3$

e.)  $x = 0$  to  $x = 2$   $(0, 2)$   $(2, -4)$   
 $\frac{2-(-4)}{0-2} = -3$

f.)  $x = -2$  to  $x = 2$   $(-2, 8)$   $(2, -4)$   
 $\frac{8-(-4)}{-2-2} = -3$

3. Which graph changes the fastest from  $[-3, 1]$ ?

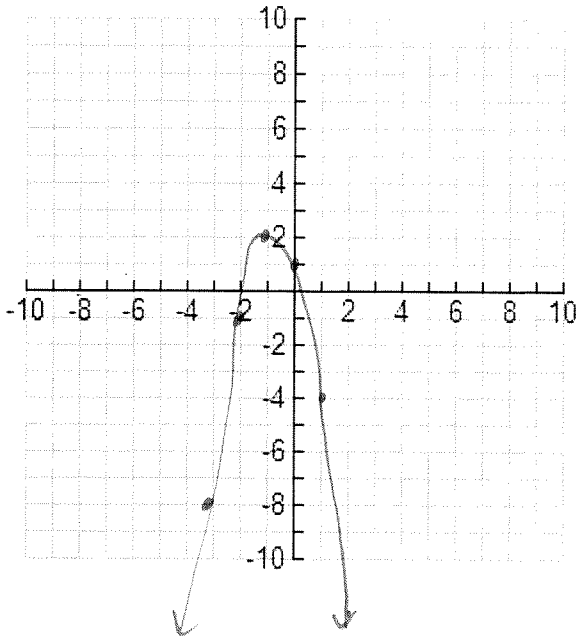
$(-3, 11)$   $(1, 3)$   
 $\frac{11-3}{-3-1} = \frac{8}{-4} = -2$

$(-3, 11)$   $(1, -1)$   
 $\frac{11-(-1)}{-3-1} = \frac{12}{-4} = -3$

LINEAR CHANGES THE FASTEST.

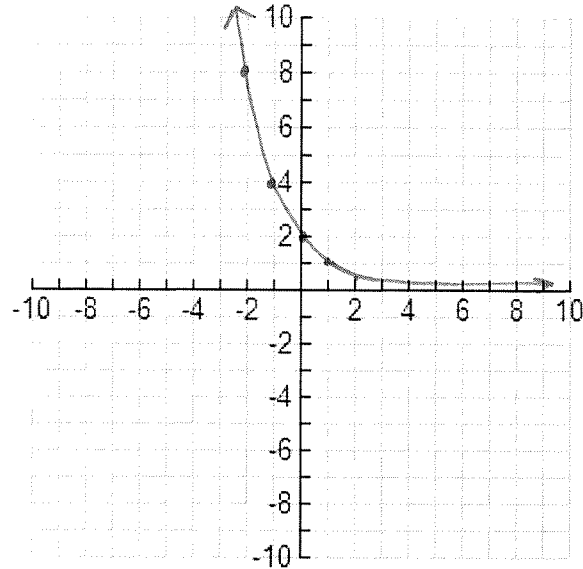
3.  $f(x) = -2x^2 - 3x + 1$

x	-3	-2	-1	0	1	2
f(x)	-8	-1	2	1	-4	-13



4.  $f(x) = 2(0.5)^x$

x	-3	-2	-1	0	1	2
f(x)	16	8	4	2	1	1/2



Find the rate of change from:

g.)  $x = -1$  to  $x = 0$

$$\begin{matrix} (-1, 2) & (0, 1) \\ \frac{2-1}{-1-0} = -1 \end{matrix}$$

Find the rate of change from:

j.)  $x = -3$  to  $x = -2$

$$\begin{matrix} (-3, 16) & (-2, 8) \\ \frac{16-8}{-3-(-2)} = -8 \end{matrix}$$

h.)  $x = 0$  to  $x = 1$

$$\begin{matrix} (0, 1) & (1, -4) \\ \frac{1-(-4)}{0-1} = -5 \end{matrix}$$

k.)  $x = 0$  to  $x = 2$

$$\begin{matrix} (0, 2) & (2, 1/2) \\ \frac{2-1/2}{0-2} = -\frac{3}{4} \approx -0.75 \end{matrix}$$

i.)  $x = 0$  to  $x = 2$

$$\begin{matrix} (0, 1) & (2, -13) \\ \frac{1-(-13)}{0-2} = -7 \end{matrix}$$

l.)  $x = -2$  to  $x = 1$

$$\begin{matrix} (-2, 8) & (1, 1) \\ \frac{8-1}{-2-1} = -\frac{7}{3} \approx -2.3 \end{matrix}$$

5. Which graph changes the fastest from  $[-2, 2]$

$$(-2, -1) \quad (2, -15)$$

$$\frac{-1-(-15)}{-2-2} = -3$$

$$(-2, 8) \quad (2, 1/2)$$

$$\frac{8-1/2}{-2-2} = \frac{-15.5}{-4} = 3.875$$

↑  
QUADRATIC CHANGES FASTER