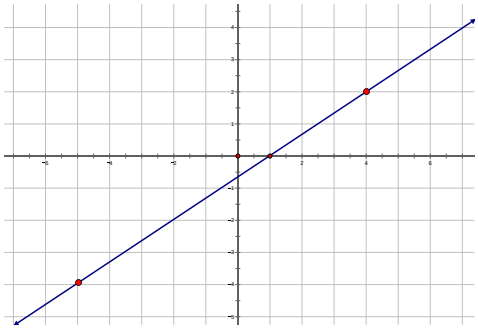
(A) Lesson Objectives

a. Review slope calculations & writing of linear equations
b. Review interpretations of slope
c. Apply interpretations of slope to real world situations
d. Practice calculating average rates of change

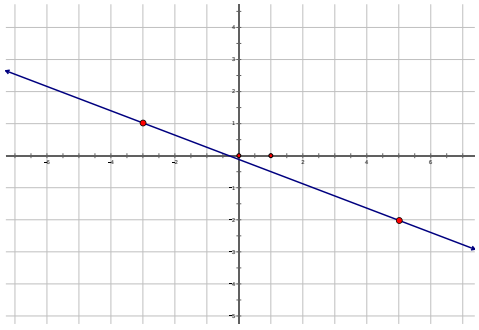
(B) SKILLS REVIEW:

a. Calculating Slope – Calculate the slope of the line between the following points:

$A(4,2)$ and $B(-5,-4)$

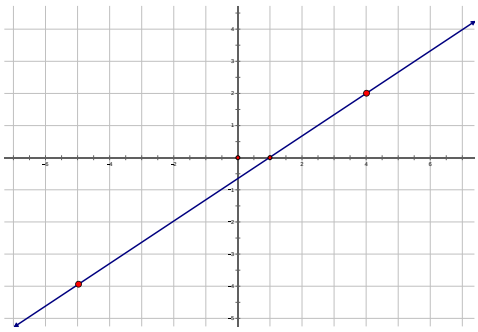


$A(-3,1)$ and $B(5,-2)$

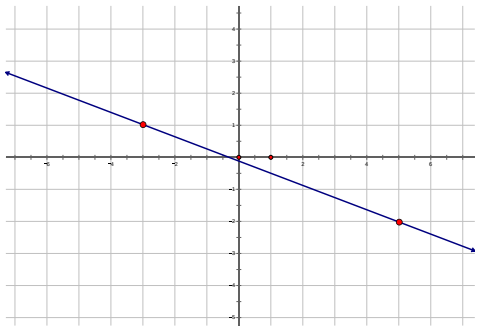


b. Writing Linear Equations – Determine the equation of the lines pictured below

$A(4,2)$ and $B(-5,-4)$



$A(-3,1)$ and $B(5,-2)$



c. Interpreting Slope ➔ CONTEXT

Here is a data set from the annual sales of DVD players (in millions of dollars)

Year	2000	2001	2002	2003
Sales (millions of $)	1717	2097	2427	3050

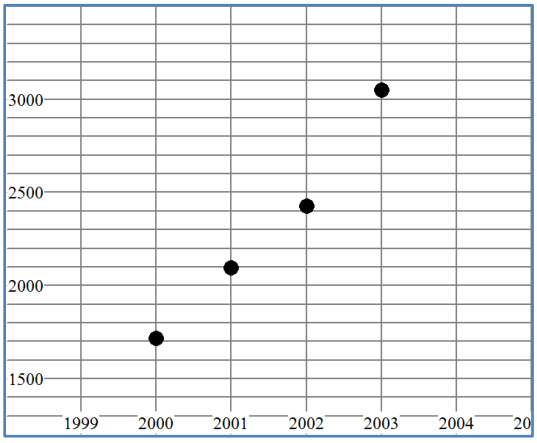
(a) Determine the slope between the following data points. Include UNITS in your work:

- Between 2000 & 2001

- Between 2001 & 2002

- Between 2000 & 2003

(b) INTERPRET the slopes you calculated (HINT ➔ units)



Here is a data set showing the number of rabbits and foxes in a national park over a month period (Jan – July). Note: t = 0 means January

Month	0	1	2	3	4	5	6
# of rabbits	1000	750	567	500	567	750	1000
# of foxes	150	143	125	100	75	57	50

(a) Determine the slope between the following data points. Include UNITS in your work

- Between t =0 and t = 1 for BOTH animals

- Between t = 4 and t = 5 for BOTH animals

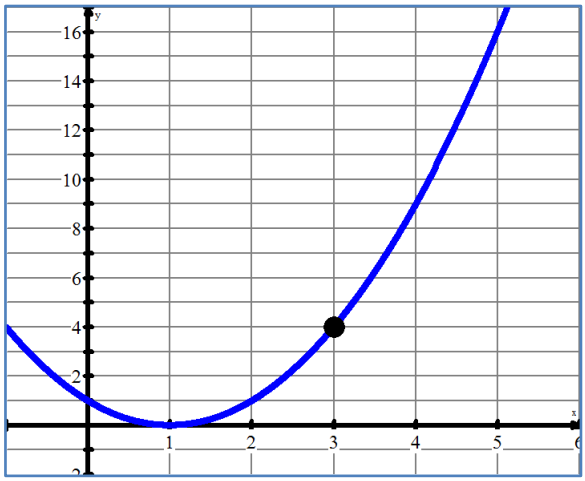
- Between t = 1 and t = 5 for RABBITS

- Between t = 0 and t = 6 for FOXES

(b) INTERPRET the slopes you calculated in (a)

(C) Exploration – Applying Rates of Change

We will now work with the function $f(x)=x^2-2x+1$



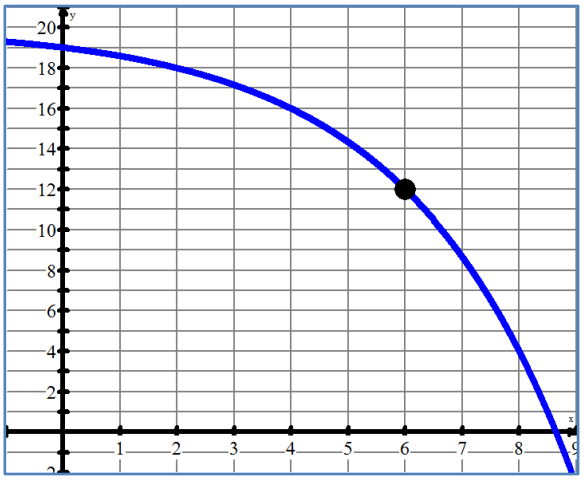
We will now work with average rates of change for this function and focus our attention on the point (3,4)

interval	$\Delta f(x)$	Δx	$\frac{\Delta f(x)}{\Delta x}$
$3 \le x \le 5$			
$3 \le x \le 4$			
$3 \le x \le 3.5$			
$3 \le x \le 3.1$			

interval	$\Delta f(x)$	Δx	$\frac{\Delta f(x)}{\Delta x}$
$1 \le x \le 3$			
$2 \le x \le 3$			
$2.5 \le x \le 3$			
$2.9 \le x \le 3$			

Conclusion ➔ what would you predict the INSTANTANEOUS rate of change to be a x = 3 and WHY?

We will now work with the function $g(x)=2^{0.5x}+3$



We will now work with average rates of change for this function and focus our attention on the point (6,12)

interval	$\Delta f(x)$	Δx	$\frac{\Delta f(x)}{\Delta x}$
$6 \le x \le 8$			
$6 \le x \le 7$			
$6 \le x \le 6.5$			
$6 \le x \le 6.1$			

interval	$\Delta f(x)$	Δx	$\frac{\Delta f(x)}{\Delta x}$
$2 \le x \le 6$			
$4 \le x \le 6$			
$5.5 \le x \le 6$			
$5.9 \le x \le 6$			

Conclusion ➔ what would you predict the INSTANTANEOUS rate of change to be a x = 6 and WHY?