

## 6.5 – Analyzing Graphs of Polynomials using Application problems Alg 2 Trig

The function  $C(s) = .013s^2 - s - 7$  estimates the wind chill temperature  $C(s)$  at  $0^\circ F$  for wind speeds ( $s$ ) from 5 to 30 mph. For example, even though the air temperature is  $0^\circ F$  it feels like  $-10^\circ F$  because of the wind chill.

a) Estimate the wind chill temperature at  $0^\circ F$  for wind speeds that are **20 mph**?  $s=20$   
 $.013(20)^2 - 20 - 7 = -21.8^\circ$



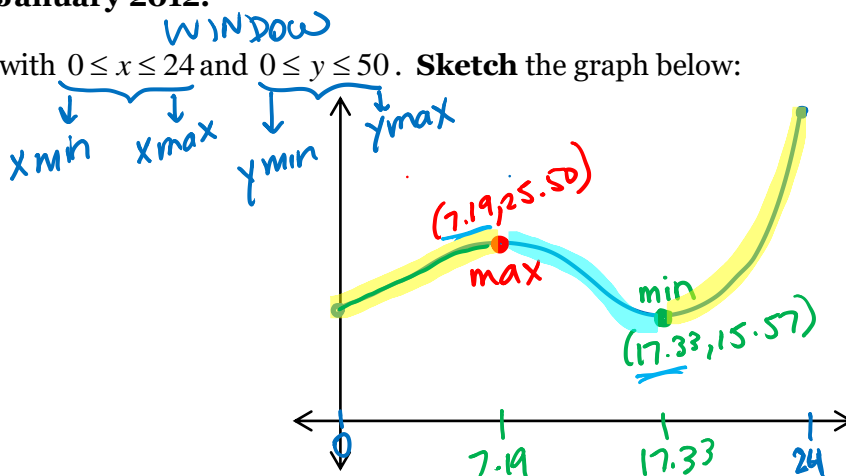
b) What is the wind speed with a wind chill at  $-15^\circ$ ?  $C=-15$   
 $(9.07, -15)$   
 $\rightarrow 9.07 \text{ mph}$

$-15 = .013s^2 - s - 7$

$y_2 \quad y_1$

The price of a share of company stock is given by:  $f(x) = .001x^4 - 0.03x^3 + 0.15x^2 + 1.01x + 18.96$  where  $x$  is the number of months since January 2012.

1. Graph the function on your calculator with  $0 \leq x \leq 24$  and  $0 \leq y \leq 50$ . Sketch the graph below:



2. Use your calculator to identify **relative maximum & relative minimum** values and where they occur.

$f(x)$  has a **relative max** value of  $\$25.50$  when  $x=7.19$ .

$f(x)$  has a **relative min** value of  $\$15.57$  when  $x=17.33$ .

3. Give the intervals of x-values for which  $f(x)$  is increasing / decreasing.

increasing }  $0 \leq x \leq 7.19$   
                  }  $17.33 \leq x \leq 24$

OR  $(0, 7.19) \cup (17.33, 24)$

decreasing  
 $7.19 \leq x \leq 17.33$   
(OR  $(7.19, 17.33)$ )

**Basic Graph Analysis (using the graphing calculator).**

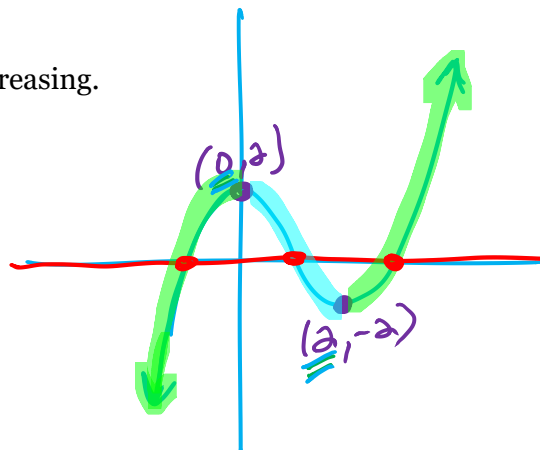
- a. Identify the real zeros. (x-intercepts) ←  $Y_2 = 0$ , use intersect
- b. Find relative max/min values and where they occur.
- c. Give intervals of x-values where  $f(x)$  is increasing/decreasing.

**Example:**  $f(x) = x^3 - 3x^2 + 2$

a) zeros →  $x = .73, 1, 2.73$

b) max →  $(0, 2)$   
min →  $(2, -2)$

c) increasing  $\left\{ \begin{array}{l} -\infty \leq x \leq 0 \\ 2 \leq x \leq \infty \end{array} \right.$   
or  
 $(-\infty, 0] \cup [2, \infty)$



decreasing  $\left\{ \begin{array}{l} 0 \leq x \leq 2 \\ \text{OR} \\ [0, 2] \end{array} \right.$