11th graders Inequalities Worksheet

Objectives:

- Ikinci dereceden bir bilinmeyenli eşitsizlik sistemlerinin çözüm kümesini cebir ve grafik yardımıyla bulur.

Materials:

- Worksheet
- TI-84 Plus calculator
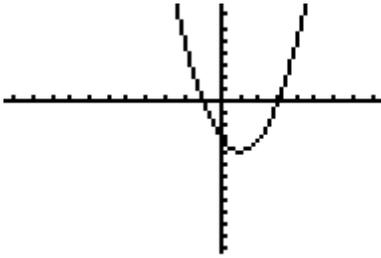- A spreadsheet software

Instructions and explanations

- It is a weekend homework but the goal is that you should complete the worksheet in an hour.
- All the process should be clearly stated when you are answering the questions.

Section 1

1-) Follow the instructions to graph x^2-2x-3 and to find zeros of the function.

- *Press the   [Y=]   and enter x^2-2x-3 then press [GRAPH]*

- *To be able to find the zeros of the function; press 2nd and CALC and then select 2: zero.*

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CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
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- *The calculator will ask you the left bound, with the up and down buttons go to the left of left intersection point of x axes and the function and press ENTER then go to the right of the same point and press ENTER two times. The zero will appear on the screen. Do the same process for right intersection point and find another zeros of the function.*

Where do you think this function has positive values and where does it have negative values? Write down your answer and explain your reasoning with two or three sentences..

2-) Follow the same procedure with the previous question to graph $-x^2+3x+4$ and to find zeros of the function.
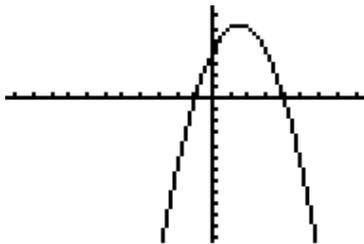
- *Do not forget to clean your screen before you graph the function.*

Where do you think this function has positive values and where does it have negative values?

Write down your answer and explain your reasoning with two or three sentences.

3-) Use your findings to determine for what values of x, x^2-2x-3 has negative values and $-x^2+3x+4$ has positive values.

Section 2

1-) Follow the instructions to draw $x^2-2x-3<0$ and $-x^2+3x+4>0$ on the same coordinate plane.

- *You should activate inequalities applications first. Therefore press APPS button and select for inequalities.*

- *Press Y= and enter the first function and then with the left button highlight the equal sign and press ALPHA and F4. Scroll down and enter the second function, highlight the equal sign and press ALPHA and F2.*
- *Press GRAPH.*

- *To be able to see more clear, press ALPHA and F2, select 1.*

What do you think about the solution set of this inequalities system? Compare your findings with results of Section 1.

Section 3

1-) Follow the instructions to compare x^2-2x-3 and $-x^2+3x+4$.

- *Open a spreadsheet in your computer. Enter -2 in the A1 column. And then for the B1 column enter= A1*A1-2*A1-3 and for the C1 column enter =- A1*A1+3*A1+4 press enter button. For the A column enter the numbers from -2 to 6 and then scroll down the square at the corner to the C9.*

Examine the table.

	A	B	C
1	-2	5	-6
2	-1	0	0
3	0	-3	4
4	1	-4	6
5	2	-3	6
6	3	0	4
7	4	5	0
8	5	12	-6

What do you see? Determine for which value of x, $x^2-2x-3<0$, $-x^2+3x+4 >0$ and $x^2-2x-3<-x^2+3x+4$

Write down your answer and explain your reasoning.

Section 4

1-) Find the solution set of $x^2+x-6<0$ and $-x^2+4x+5>0$ with the help of graphing calculator.

2-) Draw the functions and shade the area between the curves.

3-) Find the value of x where $x^2+x-6<-x^2+4x+5$ by using a spreadshead.

Section 5

1-) Examine and solve the following examples, explain your reasoning by showing your steps.

Example: Suppose that a planet's orbit can be defined by this equation: $8x^2+5y^2=40$ and the path of an asteroid can be defined be this equation: x^2-5. How can you determine where the paths of the planet and the asteroid cross?

Reflection

In this reflective paper, I discuss why I chose this particular topic to prepare a worksheet and what challenges I experienced during the preparation process. I also evaluate my worksheet according to some assessment criteria which I learned since the beginning of the semester.

I choose this particular topic because of some reasons. Firstly; I thought it can be useful for to learn an application such as inequalities in TI calculator. I did not know how to draw two inequalities on the same coordinate plane and how to shade the area between two curves. Secondly; I searched the objectives of this topic and it seems to me useful for TI calculator. The topic is also convenient for to use multiple representations such as graphs and tables. On the other hand; I had some challenges. The most dominant was the lack of resources. When I searched the sources I saw that exercises and problems are usually about linear inequalities. I had difficulties to find a real life example to represent non-linear inequalities systems. If I judge my paper, I can say that I try to prepare a worksheet which checks students understanding with open-ended questions and the help of the technology. I try to avoid multiple choice exercises because I do not believe that they are checking real understanding of the students.

This assignment helped me to look a student's eyes. I try to think just as a student and determine the points which a student may have difficulties to understand. I wanted them to

show their work therefore I can see the steps and examine their answers better. I believe that it

was a useful assignment in order to develop test preparing and assessment skills of mine.