Vector Valued Functions

GROUP MEMBERS:

1. _______________________

2. _______________________

3. _______________________

4. _______________________

Problem: Learn how to visualize vector valued functions = vector fields.

Directions: One person works at a time. Person 1 does first problem. Explain to the group what you are doing. Write out your work and answer on the sheet. When done, ask whether everyone in the group understands. People in the group ask questions. Pass the sheet to person 2 who will follow the same procedure and do second problem. Then person 3 does third problem and so on.

Vector Fields

Calculate the values of the vector function

\[ V(x,y) = (-x - y, x^2) \]

at the following points. After all these points have been calculated, then plot these vector on the next sheet.

Demo Example: \[ V(x = 1, y = 1) = (-1 - 1, 1^2) = (-2, 1) \]

At the point (1, 1) we plot the vector (-2, 1). Think of drawing a mini set of x-y axes centered at the point (1, 1). (see plot on next page).

Now you do it. First calculate the vectors. When everyone has had a turn to calculate, then each person will plot their vector at the appropriate point (next page).

Person 1. \[ V(0, 0) = \]

Person 2. \[ V(1, 0) = \]

Person 3. \[ V(1, -1) = \]

Person 4. \[ V(0, 1) = \]

Now plot these vectors at the appropriate point. Continue in the same order (Person 1, Person 2, etc). First find the point \((x, y)\) on the graph and label the point. Then starting at that point, plot the vector.
Continue calculating the vectors using the formula $V(x,y) = (-x - y, x^2)$. After you calculate your vector, then plot it.

Person 1. \[ V(-1, 1) = \]

Person 2. \[ V(-1, 0) = \]

Person 3. \[ V(-1, -1) = \]

Person 4. \[ V(0, -1) = \]