ASU ID:

Name:

CPI 400 November 30, 2008

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Mock Final

In the following, we will use data sets

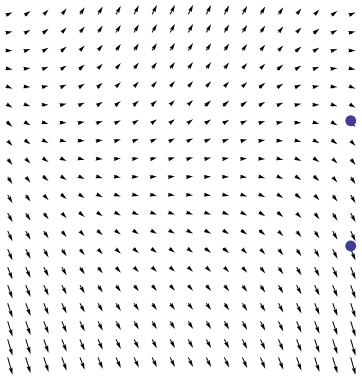
$$\begin{aligned} \mathbf{x} &= \begin{bmatrix} 0 & 2 & 4 & 8 \end{bmatrix} \\ \mathbf{y} &= \begin{bmatrix} -2 & 2 & -2 & 2 \end{bmatrix} \\ \mathbf{z} &= \begin{bmatrix} 0 & 2 & 2 & 0 \end{bmatrix} \end{aligned}$$

1. Define mean and average. What are the mean and average of $\mathbf{x}$.

2. What is the correlation coefficient of $\mathbf{x}$ and $\mathbf{z}$.

3. Sketch the scatter plot which is created by the two time series $(\mathbf{x}, \mathbf{y})$ and $(\mathbf{x}, \mathbf{z})$.

4. In the following slope field, sketch (backward direction) two functions through the given points.



5. Let a bivariate function be given by

$$f(x, y) = |x + y - 1|.$$

Sketch the zero contour of f.

6. Describe what (and using what colors) the following Mathematica code will display.

```
spheres =
  Table[{RGBColor[i/10.0, 0, 0],
    Sphere[{0,0,0}, i/4]}, {i, 0, 10}];

Graphics3D[spheres]
```

7. Given a light source and a point on an object, how is the display intensity at that point computed?

8. Let the unit cube be one cube in the Marching Cubes algorithm. If $(0, 0, 0)$ and $(1, 1, 1)$ have positive values and all others have negative values, how many triangles will be generated?

9. What is achieved by a histogram?

10. Sketch a box plot for $\mathbf{x}$.