Using Matlab to draw phase portraits This is a quick notes to help you draw phase portraits using the `quiver` command in Matlab. It is best to draw the phase portrait in small pieces. The system we shall consider is

$$\dot{x}_1 = -x_1 - 2x_2x_1^2 + x_2, \quad \dot{x}_2 = -x_1 - x_2$$

and we are interested in the region $-0.5 \le x_1 \le 0.5$, $-0.5 \le x_2 \le 0.5$. The following matlab code shows how to do this:

```
[x1, x2] = meshgrid(-.5:0.05:0.5, -.5:.05:.5);
x1dot = -x1 - 2 *x2 .*x1.^2+x2; %Note the use of .* and .^
x2dot = -x1-x2;
quiver(x1,x2,x1dot, x2dot)
```

The resulting figure is as shown.

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