In [52]:
```
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
```

Experiment 1

Variable:

- Probability of infection
  - Trials with p=.1, p=.4, p=.7

Controls:

- Population: 1000 People
- Length of infection: 5 days
- Vaccinations: 0

Read in each line of `output.txt` as a list. Then, each row in `data` is a trial.

In [53]:
```
file = open("output.txt", "r")
data = []
for item in file:
    data.append([int(x) for x in item.split()])
```

In [54]:
```
fig, ax = plt.subplots()
for i in range(len(data)):
    ax.plot(data[i], label='p: {:.1f}'.format(.1 + i*.3))
ax.set(xlabel='Days Since Initial Infection', ylabel='Sick Population',
       title='Sick Population over Time (p: probability of infection)')
ax.legend()
ax.grid()
fig.savefig("population.png")
plt.show()
```

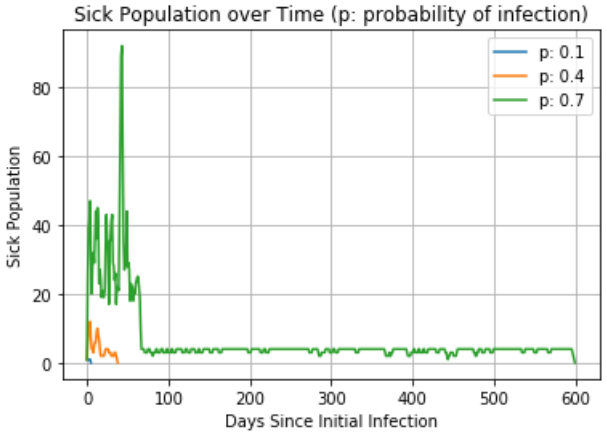

Figure 1

- Higher probability of infection causes diseases to last much longer

Experiment 2

Variable:

- Number of vaccinations
  - Trials v=0, v=50, v=100, v=150, v=200

Controls:

- Population: 1000 People
- Length of infection: 5 days
- Probability of infection: p=.5

Read in each line of `outputWithVaccination.txt` as a list. Then, each row in `dataWithVaccination` is a trial.

In [55]:
```
fileWithVaccination = open("outputWithVaccination.txt", "r")
dataWithVaccination = []
for item in fileWithVaccination:
    dataWithVaccination.append([int(x) for x in item.split()])
```

In [56]:
```
fig, ax = plt.subplots()
for i in range(len(dataWithVaccination)):
    ax.plot(dataWithVaccination[i], label='vaccinations: {}'.format(50*i))
ax.set(xlabel='Days Since Initial Infection', ylabel='Sick Population',
       title='Sick Population over Time (varying vaccinations)')
ax.legend()
ax.grid()
fig.savefig("populationWithVaccination.png")
plt.show()
```

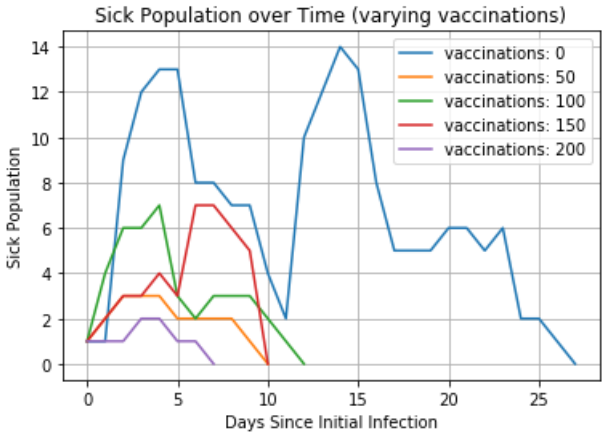

Figure 2

- Populations with more vaccinations tend to eradicate the disease faster