NAME: _____

Answer all problems on this page.

1. (6 points) A financial market's value increases by 24% on good days and by 9% on normal days. It decreases by 12% during a bad day.
   (a) (3 points) What is the expected growth of this market if each day is equally likely?
   (b) (3 points) Would the market be more profitable if normal days were twice as likely as the two other (equally likely) events?
2. (6 points) Assume a sample of 25 people randomly selected from a population where 20% failed to pay rent last month.
   (a) (3 points) Calculate the mean and standard deviation of failure to pay rent in the sample. Provide the formula for each.
   (b) (3 points) How likely is it to pick three people at random in this sample and get only one who failed to pay rent? Provide the formula used.
3. (8 points) A country usually emits 8 tons of carbon dioxide CO_2 emissions per capita per year.

   Annual trade sanctions can coerce this country into lowering its level of CO_2 emissions by $s = 25\%$. The probability of successful coercion through trade sanctions is observed to be $p = 20\%$.
   (a) (2 points) How much CO_2 emissions is this country expected to produce on average?
   (b) (2 points) What level of success p should the trade sanctions reach for that country to emit less than 5 tons of CO_2 per capita on average?
   (c) (2 points) Find the level of sanction s at which that country emits less than 7 tons of CO_2 per capita on average.
   (d) (2 points) Alternately, if the level of sanctions cannot be increased, how large should p be to attain that same maximum level of CO_2 emissions?