Mean and variance of a discrete random variable - An example

An insurance policy costs $100, and will pay policyholders $10000 if they suffer a major injury (resulting in hospitalization) or $3000 if they suffer a minor injury (resulting in lost time from work). The company estimates that each year 1 in every 2000 policyholders may have a major injury, and 1 in 500 a minor injury.

a. Construct the probability distribution for the profit on a policy.

b. What is the company’s expected profit on this policy?

c. Do you think the standard deviation is large or small. Why?

d. Compute the standard deviation.

e. Suppose that the company writes (a) 36, (b) 10000 of these policies per year. What are the mean and standard deviation of the annual profit for these 2 cases?

f. Comment!