(a) General formula for expected value:

E[X]=p*(1*pa+2*pb+3*pc+4*pd)

E[X^2] = p*(1*pa+4*pb+9*pc+16*pd)

Variance= E[X^2] - E[X]^2

   (1) E[X]=2.5p
      Variance=7.5p-6.25p^2
   (2) E[X]=2.5p
      Variance=7.5p-6.25p^2
   (3) E[X]=2.5p
      Variance=7.5p-6.25p^2
   (4) E[X]=4p
      Variance=7.5p-6.25p^2.

(b) In case (4) it exceeds for p>0.625