

17.

- a.  $P(2) = P(Y = 2) = P(\text{1st 2 batteries are acceptable})$   
 $= P(AA) = (.9)(.9) = .81$
- b.  $p(3) = P(Y = 3) = P(UAA \text{ or } AUA) = (.1)(.9)^2 + (.1)(.9)^2 = 2[(.1)(.9)^2] = .162$
- c. The fifth battery must be an A, and one of the first four must also be an A. Thus,  $p(5) = P(AUUUA \text{ or } UAUUA \text{ or } UUAUA \text{ or } UUUAA) = 4[(.1)^3(.9)^2] = .00324$
- d.  $P(Y = y) = p(y) = P(\text{the } y^{\text{th}} \text{ is an A and so is exactly one of the first } y - 1)$   
 $= (y - 1)(.1)^{y-2}(.9)^2, y = 2, 3, 4, 5, \dots$