Answer on Question #83340 – Math – Statistics and Probability

Question

Given that Y~b(y; 4, 0.4), find the probabilities of the following events:
(a) P(Y<2)
(b) P(Y=2)
(c) P(Y>2)

Solution

(a) P(Y<2):

$P(Y<2)$ = Y~b(0; 4, 0.4) + Y~b(1; 4, 0.4) = $\frac{4!}{0!*(4-0)!} 0.4^0 (1-0.4)^{4-0}$ +

+ $\frac{4!}{1!*(4-1)!} 0.4^1 (1-0.4)^{4-1}$ = 0.1296 + 0.3456 = 0.4752

(b) P(Y=2):

$P(Y=2)$ = Y~b(2; 4, 0.4) = $\frac{4!}{2!*(4-2)!} 0.4^2 (1-0.4)^{4-2}$ = 0.3456

(c) P(Y>2)

$P(Y>2)$ = Y~b(3; 4, 0.4) + Y~b(4; 4, 0.4) = $\frac{4!}{3!*(4-3)!} 0.4^3 (1-0.4)^{4-3}$ +

+ $\frac{4!}{4!*(4-4)!} 0.4^4 (1-0.4)^{4-4}$ = 0.1536 + 0.0256 = 0.1792

Answer:

(a) *P (Y<2)* = 0.4752;

(b) *P (Y=2)* = 0.3456;

(c) *P (Y>2)* = 0.1792.