

15C # 1.  $X \sim B(4, \frac{1}{2})$   $(\frac{1}{2} + \frac{1}{2})^4$

(a)  $P(X=1) = \binom{4}{1} (\frac{1}{2})^1 (\frac{1}{2})^3 = \frac{4}{16} = \frac{1}{4}$

discrete distribution

combination  $\binom{n}{k}$  (n successes)

$\uparrow$   $\uparrow$   $\uparrow$   
4 1 p q

(b)  $P(X < 1) = P(X=0) = \binom{4}{0} (\frac{1}{2})^0 (\frac{1}{2})^4 = \frac{1}{16}$

(c)  $P(X \leq 1) = P(X=0) + P(X=1)$   
 $= \frac{1}{16} + \frac{1}{4} = \frac{5}{16}$

(d)  $P(\underline{X} \geq 1) = 1 - P(X=0) = 1 - \frac{1}{16} = \frac{15}{16}$

(2a) binomial pdf  $(6, 1/3, 2)$

$$(b) P(X < 2) = P(X \leq 1)$$

$$= \underset{\substack{\uparrow \\ \text{cumulative}}}{\text{binomial cdf}}(6, 1/3, 1)$$

$$(c) P(X \leq 2) = \text{binomial cdf}(6, 1/3, 2)$$

$$(d) P(X \geq 2) = 1 - P(X \leq 1)$$

$$= 1 - \text{binomial cdf}(6, 1/3, 1)$$

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15D #3.  $X =$  number of faulty components

$$X \sim B(16, 0.01)$$

$$a) P(X = 0) = \binom{16}{0} (0.01)^0 (0.99)^{16} = 0.851$$

$$b) P(X = 3) = \binom{16}{3} (0.01)^3 (0.99)^{13} \\ = 0.000491$$

$$c) P(X \geq 2) = 1 - P(X \leq 1)$$

$$= 1 - \text{binomialcdf}(16, 0.01, 1)$$

$$= 0.0109$$

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Binomial Distribution Quiz

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HW. boardwork

15 C #3 calculator

15 D #5

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