

1. Let $X \sim \mathcal{B}(3, .2)$ (binomial distribution) find $F_X(x)$ the cumulative probability distribution function and graph it.
2. Suppose that Y is a continuous random variable and:

$$F_Y(y) = \begin{cases} 1 - e^{-5y} & \text{if } x \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

- (a) Graph $F_Y(y)$
 - (b) Show $F_Y(y)$ satisfies all the properties of a cumulative probability distribution function.
 - (c) Find and graph $f_Y(y)$ the probability density function of Y .
 - (d) Find $P(-2 \leq Y \leq 7)$.
3. Suppose the number of students that come to a walk in tutoring center is 4 per hour, and that $1/3$ of the students that come are boys. What is the probability that the first boy student arrives between the 30th and 60th minute the center is open.