

Ch 2 Probability Distribution Functions ∪ Ch 4 Special Distributions**In-Class Activity #5****Dr. Basilio**

Mon Jan_28 ∪ Tues Jan_29

* * *

Chapter 4: Probability Distribution Functions**Inverse Normal Distribution****Activity 1: Inverse-Normal-Distribution**

Find the 90th percentile for a normal distribution with a mean of 70 and a standard deviation of 4.5.

Activity 2: Inverse-Normal-Distribution

The time it takes employees to get to work from home (in minutes) is normally distributed with a mean of 30 minutes, and a standard deviation of 5 minutes. Find:

- (a) the percentage of employees that take between 28 and 37 minutes to get to work (Hint: this is not an inverse problem)
- (b) The number of minutes the longest it would take the bottom employee in the bottom 5% of the data to get to work. (Hint: this is an inverse problem)

Activity 3: Inverse-Normal-Distribution

An average light bulb manufactured in a factory lasts 280 days with a standard deviation of 45 days. Assume that bulb life is normally distributed.

- (a) What is the probability that an Acme light bulb will last at most 360 days? (Hint: this is not an inverse problem)
- (b) What bulb life separates the bottom 12%? (Hint: this is an inverse problem)

Poisson Distribution

Activity 4: Poisson-Distribution

ACME Realty reports it sells 75 homes in 25 days. What is the probability that exactly 2 homes will be sold tomorrow? (*Note: this is problem 8 from our Midterm review*) Round answers to four decimal places.

Activity 5: Poisson-Distribution

A company makes electrical motors. The probability an electrical motor is defective is 0.01. What is the probability that a sample of 415 electrical motors will contain exactly five defective motors? Round answers to four decimal places. (*Hint: use $\lambda = n \cdot p$*)

Activity 6: Poisson-Distribution

Round answers to four decimal places. A Life Insurance (LI) salesman sells on average 3 LI policies per week. Assuming a Poisson Distribution, calculate the probability that in a given week she will sell:

- (a) some policies
- (b) 2 or more but less than 5 policies
- (c) Assuming a five day workweek, what is the probability that in a given day, she will sell a policy?

Activity 7: Visualizing-Poisson-Distribution

A 911 operator receives about six telephone calls between 8 a.m. and 10 a.m.

- (a) What is the probability that she receives more than one call in the next 15 minutes?
- (b) Plot the histogram for the probability $P(x) = P(X = x)$ for $x = 0, 1, 2, 3, 4 \dots$

x	$P(x)$
\vdots	\vdots