

Math 10 - Homework Chapter 5 Answers

1. Explain the difference between population parameters and sample statistics. What symbols do we use for the mean and standard deviation for each of these?

Parameters are fixed values that are determined by the population. (μ , σ)

Statistics are calculated from the sample and can change when different samples are taken (\bar{X} , s)

2. Consider the following probability distribution function of the random variable X which represents the number of bedrooms in a neighborhood's homes:

X	P(X)	xP(x)	(x- μ)	(x- μ) ²	(x- μ) ² P(x)
0	0.05	0.0	-2.8	7.84	0.392
1	0.1	0.1	-1.8	3.24	0.324
2	0.2	0.4	-0.8	0.64	0.128
3	0.4	1.2	0.2	0.04	0.016
4	0.15	0.6	1.2	1.44	0.216
5	0.1	0.5	2.2	4.84	0.484
		2.8			1.56

- a. Fill in the missing P(X)
0.1
- b. Find the population mean of X.
 $\mu = 2.8$ bedrooms
- c. Find the population variance and standard deviation of X.
 $\sigma^2 = 1.56$ $\sigma = 1.249$
3. 10% of all children at large urban elementary school district have been diagnosed with learning disabilities. 10 children are randomly and independently selected from this school district.
- a. Let X = the number of children with learning disabilities in the sample. What type of random variable is this?
Binomial n=10, p=.10
- b. Find the mean and standard deviation of X.
 $\mu=(10)(.1)=1$ $\sigma^2=(10)(.1)(.9)=.9$ $\sigma = \text{sqrt}(.9) = .949$
- c. Find the probability that exactly 2 of these selected children have a learning disability.
from table: P(X=2)=.194
- d. Find the probability that at least 1 of these children has a learning disability.
from table: P(X>=1) = 1-P(X=0) = 1-.349 = .651
- e. Find the probability that less than 3 of these children have a learning disability.
from table: P(X<3) = .349+.387+.194 = .93