

Take Home Exam for Spring Break

March 30, 2018
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Due Date: Tuesday April 10, 2018

1. Borachio works in an automotive tire factory. The number x of sound but blemished tires that he produces on a random day has the probability distribution

x	2	3	4	5
$p(x)$	0.48	0.36	0.12	0.04

- (a) Find the probability that Borachio will produce more than three blemished tires tomorrow.
- (b) Find the probability that Borachio will produce at most two blemished tires tomorrow.
- (c) Compute the mean and standard deviation of x .
2. Pomegranates are sold in crates of 10. It is estimated that about 25% of the pomegranates in a crate are bad.
- (a) What's the expected number of good pomegranates in a crate?
- (b) What's the standard deviation of the number of good pomegranates in a crate?
- (c) What's the probability that there are at least 8 good pomegranates in a crate?
3. The amount x of beverage in a can labeled 12 ounces is normally distributed with mean 12.1 ounces and standard deviation 0.05 ounce. A can is selected at random.
- (a) Find the probability that the can contains at least 12 ounces.
- (b) Find the probability that the can contains between 11.9 and 12.1 ounces.
4. Heights X of adult men are normally distributed with mean 69.1 inches and standard deviation 2.92 inches. Juliet, who is 63.25 inches tall, wishes to date only men who are taller than she but within 6 inches of her height. Find the probability that the next man she meets will have such a height.
5. Tests of a new light bulb led to an estimated mean life of 1,321 hours and standard deviation of 106 hours. The manufacturer will advertise the lifetime of the bulb using the largest value for which it is expected that 90% of the bulbs will last at least that long. Assuming bulb life is normally distributed, find that advertised value.
6. Scores on the common final exam given in a large enrollment multiple section course were normally distributed with mean 69.35 and standard deviation 12.93. The department has the rule that in order for a student to receive a B in the course their score must be in the top 20% of all exam scores. Find the minimum exam score that meets this requirement.