

Review for test 4

1. Let E and F be two events of an experiment,  $P(E) = 0.30$  and  $P(F) = 0.20$ , and  $P(E \cup F) = 0.35$ . Find the following probabilities:

a.  $P(E \cap F)$

b.  $P(E^c \cap F)$

c.  $P(E | F)$

d.  $P(F|E^c)$

2. Companies A, B, and C produce 10%, 40% and 50% respectively of the Model II computer. It has been found 1% from A, 1½% from B and 2% from C are found to be defective. Find the following probabilities:

a. Find the probability of a computer being defective.

b. Find the probability of a computer being defective given it came from company C.

c. If it is found that a computer is defective, find the probability it came from company A.

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3. The odds for rain tomorrow are 2:3. What is the probability of it not raining?

4. The probability of a horse winning is 0.4. What are the odds of the horse winning?

5. One of 2 bands is chosen at random with equally likely probability then a band member is chosen at random from the chosen band. Band one has 30 boys and 20 girls. Band two has 20 boys and 25 girls. Find the indicated probabilities:

a. What is the probability that band two was chosen, given a boy was chosen?

b. What is the probability that a girl was chosen?

c. What is the probability a boy was chosen given band one was chosen?

6. A 45 point quiz was given to a history class. The scores are listed below with the corresponding probability. Find the average for this class.

X	30	32	33	37	42
P(X = x)	0.15	0.225	0.175	0.3	0.1

7. Given the following probability distribution with an expected value of 6.7. Find the standard deviation.

X	3	5	9	12
P(X = x)	0.4	0.2	0.1	0.3

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8. The heights of 4,000 women who participate in a recent survey have a mean of 64.5 inches and a standard deviation of 2.5. Use Chebychev's Inequality to estimate the probability that a woman chosen at random height will be between 60.5 and 68.5.

9. Consider the binomial experiment. The probability that cell phone is defective is 0.11. If a sample of 6 cell phones is selected at random.

a. What is the probability at least two are defective?

b. What is the mean or expected value?

c. What is the Variance and standard deviation?

10. Consider the following binomial experiment. The probability that a person will get a cold this winter is 0.55. A sample of 10 people were chosen random.

a. Find the probability that is at least 2 people will get a cold.

b. Find the probability that is exactly five people will get a cold

11. Let  $Z$  be a standard normal random variable. Find the following probabilities:

a.  $P(Z < -1.47)$

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b.  $P(Z > -1.87)$

c.  $P(1.1 < Z < 2.13)$

d.  $P(Z < z) = .8264$

e.  $P(Z > z) = .8665$

f.  $P(-z < Z < z) = .8690$

12. The heights of award winning tomatoes plants were normally distributive with a mean of 10 inches and a standard deviation of 2 inches. Find the probability that a plant selected at random measures between 8 and 12.

13. The test scores on the last exam for the students in Finite were normally distributive with a mean 72 and a standard deviation of 10. What is the probability that a student scored below a 60?

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14. Use the normal distribution to approximate the binomial distribution. A flu vaccine has a probability of 20% of not preventing a person who is inoculated from getting the flu. A county health office inoculated 134 people. Find the probability that fewer than 20 will get the flu.