

Disclaimer

© 2017 Your Stat Class. Latrica L. Williams

ALL RIGHTS RESERVED. No part of this work covered by the copyright herein may be reproduced, transmitted, stored, or used in any form or by any means, graphic, electronic, or mechanical including but not limited to photocopying, recording, scanning, digitizing, taping, Web distribution, information networks, information storage and retrieval systems, without written permission of the company or author. Use in violation of these terms and conditions is prohibited.

REPRODUCING THIS WORK BY ANY MEANS WILL RESULT IN LEGAL ACTION. VIOLATORS WILL BE PROSECUTED TO THE FULL EXTENT OF THE LAW.



Chapter 6 Homework



Chapter 6 Homework

1. Define random variable.
2. Define discrete random variable.
3. Define continuous random variable.
4. What is the mean and standard deviation of the following discrete probability distribution?

x	100	150	200	250
P(x)	0.21	0.33	0.14	0.32

5. What is the mean and standard deviation of the following discrete probability distribution?

x	19	20	21	22
P(x)	0.44	0.32	0.02	0.22

6. In a sample of 10 Americans, 45% of them have brown eyes.
 - a) Find the probability that exactly 2 Americans selected from this sample have brown eyes.
 - b) Find the probability that exactly 4 Americans selected from this sample have brown eyes.
7. True or False. The area under the curve of a normal distribution is equal to 0.
8. True or False. Normal distributions can also be referred to as bell-shaped distributions.
9. True or False. The standard normal distribution is a normal distribution with a mean of 1 and a standard deviation of 0.



10. Using the Standard Normal Table, determine the following:
- a) $P(z < -1.24)$
 - b) $P(z < -3.01)$
 - c) $P(z \geq 2.21)$
 - d) $P(-0.36 \leq z \leq 1.11)$
 - e) $P(-0.75 \leq z \leq 0.75)$
11. A manufacturer claims its new candle has a mean lifespan of 90 hours with a standard deviation of 3 hours. Assume the distribution is normal. What is the probability that a randomly selected candle has a lifespan of
- a) less than 96 hours?
 - b) between 87 and 93 hours?
 - c) at least 90 hours?

Use the Standard Normal Table to determine the probabilities.

12. Assume a distribution is normal with a mean of 70 and a standard deviation of 3. If 75 people are selected, what is the standard error of the mean?
13. Assume a distribution is normal with a mean of 144 and a standard deviation of 20. If 100 people are selected, what is the standard error of the mean?
14. The ages of employees at a law firm follow a normal distribution with a mean of 50 years and a standard deviation of 5 years. If 25 employees are randomly selected, what is the probability that the average age is
- a) between 48 and 52 years?
 - b) more than 53 years?
 - c) less than 47 years?

Use the Standard Normal Table to determine the probabilities.

15. Define the Central Limit Theorem.



Answers

1. Random Variable: a variable whose values are determined by random variations.
2. Discrete Random Variable: a random variable that has countable values.
3. Continuous Random Variable: a random variable that has measurable values.
4. 178.5, 57.1
5. 20.02, 1.16
6. a) 0.076, b) 0.238
7. False
8. True
9. False
10. a) 0.1075, b) 0.0013, c) 0.0136, d) 0.5071, e) 0.5468
11. a) 0.9772, b) 0.6826, c) 0.5000
12. 0.35
13. 2
14. a) 0.9544, b) 0.0013, c) 0.0013
15. The Central Limit Theorem: as the sample size increases, typically $n \geq 30$, the sampling distribution of the sample mean becomes approximately normal, regardless of the shape of the population's distribution.

