

NORMAL DISTRIBUTION: REVIEW*

Kathy Chu, Ph.D.

Based on *Normal Distribution: Review*[†] by

Susan Dean

Barbara Illowsky, Ph.D.

This work is produced by OpenStax-CNXX and licensed under the
Creative Commons Attribution License 3.0[‡]

The next two questions refer to: $X \sim U(3, 13)$

Exercise 1

(Solution on p. 3.)

Explain which of the following are false and which are true.

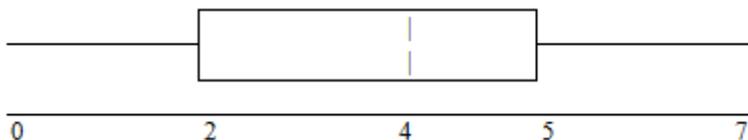
- a: $f(x) = \frac{1}{10}, 3 \leq x \leq 13$
- b: There is no mode.
- c: The median is less than the mean.
- d: $P(X > 10) = P(X \leq 6)$

Exercise 2

(Solution on p. 3.)

Calculate:

- a: Mean
- b: Median
- c: 65th percentile.



Exercise 3

(Solution on p. 3.)

Which of the following is true for the above box plot?

- a: 25% of the data are at most 5.
- b: There is about the same amount of data from 4 – 5 as there is from 5 – 7.
- c: There are no data values of 3.
- d: 50% of the data are 4.

*Version 1.1: Aug 27, 2009 11:38 pm -0500

[†]<http://cnx.org/content/m16985/1.9/>

[‡]<http://creativecommons.org/licenses/by/3.0/>

Exercise 4*(Solution on p. 3.)*

If $P(G | H) = P(G)$, then which of the following is correct?

A: G and H are mutually exclusive events.

B: $P(G) = P(H)$

C: Knowing that H has occurred will affect the chance that G will happen.

D: G and H are independent events.

Exercise 5*(Solution on p. 3.)*

If $P(J) = 0.3$, $P(K) = 0.6$, and J and K are independent events, then explain which are correct and which are incorrect.

A: $P(J \text{ and } K) = 0$

B: $P(J \text{ or } K) = 0.9$

C: $P(J \text{ or } K) = 0.72$

D: $P(J) \neq P(J | K)$

Solutions to Exercises in this Module

Solution to Exercise (p. 1)

- a: True
- b: True
- c: False – the median and the mean are the same for this symmetric distribution
- d: True

Solution to Exercise (p. 1)

- a: 8
- b: 8
- c: $P(X < k) = 0.65 = (k - 3) * \left(\frac{1}{10}\right)$. $k = 9.5$

Solution to Exercise (p. 1)

- a: False – $\frac{3}{4}$ of the data are at most 5
- b: True – each quartile has 25% of the data
- c: False – that is unknown
- d: False – 50% of the data are 4 or less

Solution to Exercise (p. 2)

D

Solution to Exercise (p. 2)

- A: False - J and K are independent so they are not mutually exclusive which would imply dependency (meaning $P(\text{J and K})$ is not 0).
- B: False - see answer C.
- C: True - $P(\text{J or K}) = P(\text{J}) + P(\text{K}) - P(\text{J and K}) = P(\text{J}) + P(\text{K}) - P(\text{J})P(\text{K}) = 0.3 + 0.6 - (0.3)(0.6) = 0.72$. Note that $P(\text{J and K}) = P(\text{J})P(\text{K})$ because J and K are independent.
- D: False - J and K are independent so $P(\text{J}) = P(\text{J|K})$.