Note to Students: STOP!!! If you have access to technology, THIS IS THE WRONG ASSIGNMENT!

Go back and find the online assignment instructions for this week.

Algebra 2: Week 8 (Offline) Assignments

5/26 – 6/1

Directions: Complete all the items below and turn in the completed work to the office on Monday from 12 -3 pm or take a picture of the work and email it to your Algebra 2 teacher. BE SURE ASSIGNMENTS ARE CLEARLY LABELED AND YOUR NAME IS ON THEM!

Part 1: Guided Notes on Section 11.1

- Read Section 11.1 of the textbook and **fill in the attached guided notes**.

Part 2: Textbook Problems

- On a separate piece of paper, **complete the following problems from the textbook:**
  - **Section 11.1 on page 600-602: #4-6, 14, 16, 18, 22, 23, 26, 27, 28, 35**

Part 3: Quizizz Assignment

- **Complete the multiple choice Quizizz worksheet** (attached). You may write on the page or show your work on a separate piece of paper.

Additional Resources:

The last pages of this packet may be helpful for completing this week's assignments.

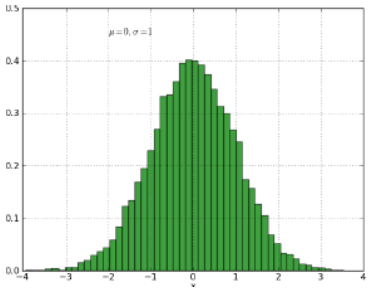
- Answer Key to the Section 11.1 Guided Notes

Have questions about the assignment? Contact your Algebra 2 teacher for help.

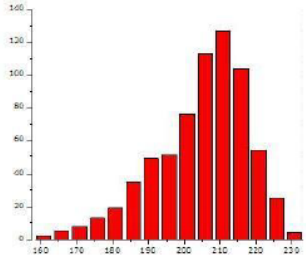
11.1: Using Normal Distributions

One type of probability distribution is a ***normal distribution***. The graph of a normal distribution is a bell-shaped curve called a ***normal curve*** that is symmetric about the ***mean*** (the average).

This is normal:



This is not:



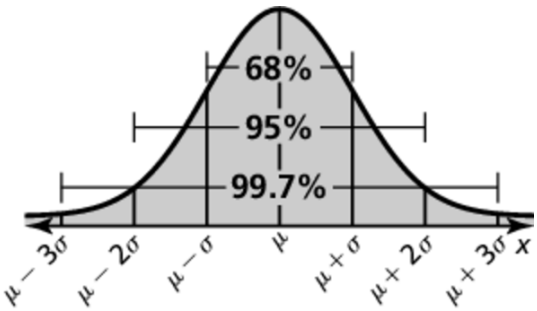
Core Concepts

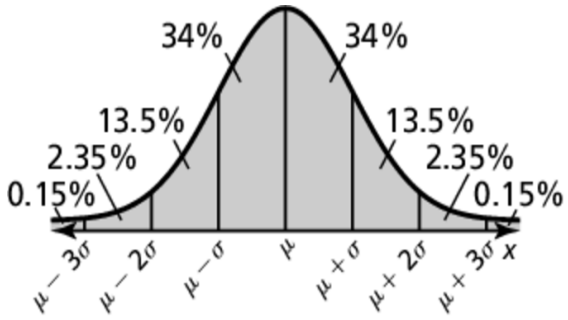
Area Under a Normal-Distribution Curve

*Note: $\boldsymbol{\mu}$ (***Greek letter mu***) & $\boldsymbol{\sigma}$ (***Greek letter sigma***)

A normal distribution with **mean, μ,** and **standard deviation, σ,** has the following properties:

- It is centered at the mean and is symmetrical.
- The total area under the related normal curve is 1 (aka 100%).
- About 68% of the area lies within 1 standard deviation of the mean.
- About 95% of the area lies within 2 standard deviations of the mean.
- About 99.7% of the area lies within 3 standard deviations of the mean.

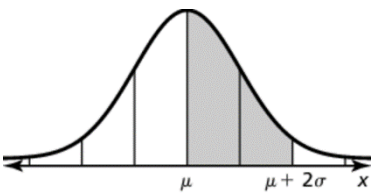




Finding a Normal Probability: The areas under a normal curve can be interpreted as probabilities in a normal distribution. So, in a normal distribution, the probability that a randomly chosen x-value is between a and b is given by the area under the normal curve between a and b. This would be written as $P(a < x < b)$.

For Example: A normal distribution has **mean, μ,** and **standard deviation, σ .** A value, x, is randomly selected from the distribution. Find $P(\mu < x < \mu + 2\sigma)$.

Solution:



$$P(\mu < x < \mu + 2\sigma) = 0.34 + 0.135 = 0.475$$

Another way to look at it is using percentages:

$$P(\mu < x < \mu + 2\sigma) = 34\% + 13.5\% = 47.5\%$$

In Exercises 1–4, a normal distribution has mean, μ , and standard deviation, σ. Find the indicated probability for a randomly selected *x*-value from the distribution.

1. $P(x \leq \mu - 2\sigma)$

2. $P(x \geq \mu - 3\sigma)$

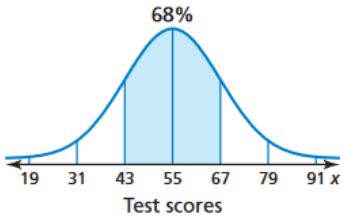
3. $P(\mu - \sigma \leq x \leq \mu + 3\sigma)$

4. $P(\mu - 2\sigma \leq x \leq \mu + \sigma)$

Interpreting Normally Distributed data:

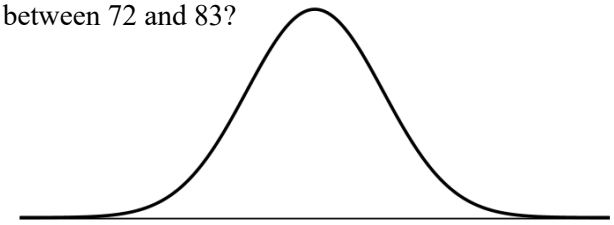
For Example: The scores for a state's peace officer standards and training test are normally distributed with a mean of 55 and a standard deviation of 12. The test scores range from 0 to 100. About what percent of the people talking the test have scores between 43 and 67?

Solution: The scores of 43 and 67 represent one standard deviation of either side of the mean, as shown. So, about 68% of the people taking the test have scores between 43 and 67.



5. The scores for a math course test are normally distributed with a mean of 61 and a standard deviation of 11. The test scores range from 0 to 100.

a. About what percent of the students taking the test have scores between 72 and 83?



b. About what percent of the students taking the test have scores less than 50?

QUIZIZZ

NAME : _____

CLASS : _____

DATE : _____

The Normal Distribution

10 Questions

1. Which of the following is true about a normal distribution?

☐ a) The distribution looks like a bell-shaped curve

☐ b) The distribution is centered at the mean and is symmetric about the mean

☐ c) About 68% of the area under the curve lies within 1 standard deviation of the mean

☐ d) All of these are true

2. A normal distribution has mean μ and standard deviation σ . Find $P\left(\mu - 2\sigma \leq x \leq \mu + \sigma\right)$

☐ a) About 68.7%

☐ b) About 81.9%

☐ c) About 43.5%

☐ d) About 13.5%

3. A normal distribution has a mean μ and standard deviation σ . Find $P\left(x \geq \mu + 2\sigma\right)$.

☐ a) About 34%

☐ b) About 16%

☐ c) About 8%

☐ d) About 2.5%

4. The GPA of students in a course at UC Davis are normally distributed with a mean of 3.2 with a standard deviation of 0.3. What percent of students in the course have a GPA between 2.9 and 3.8?

☐ a) 81.5%

☐ b) 47.5%

☐ c) 68%

☐ d) 95%

5. The shelf life of a particular dairy product is normally distributed with a mean of 12 days and a standard deviation of 3 days. About what percent of the products last between 12 and 15 days?

☐ a) 68%

☐ b) 34%

☐ c) 16%

☐ d) 2.5%

6. Adult male heights are normally distributed with a mean of 70 inches and a standard deviation of 4 inches. Mr. Richardson is 66 inches tall. What percentage of adult males are shorter than Mr. Richardson?

☐ a) About 95% of adult males are shorter than Mr. Richardson

☐ b) About 34% of adult males are shorter than Mr. Richardson

☐ c) About 16% of adult males are shorter than Mr. Richardson

☐ d) About 12.5% of adult males are shorter than Mr. Richardson

7. The heights of adult females are normally distributed with a mean of 65 inches and standard deviation of 3.5 inches. Suppose a company makes body suits that fit people between 68.5 inches to 75.5 inches. About what percent of adult females would be able to use these suits?

☐ a) About 2.5% of adult females would be able to fit these suits

☐ b) About 47.5% of adult females would be able to fit these suits

☐ c) About 15.9% of adult females would be able to fit these suits

☐ d) About 0.15% of adult females would be able to fit these suits

8. The lifespan of zebras in a particular zoo are normally distributed. The average zebra lives 20.5 years; the standard deviation is 3.9 years. Estimate the probability that a zebra lives longer than 32.2 years.

☐ a) There is about a 12.5% chance that a zebra lives longer than 32.2 years.

☐ b) There is about a 3% chance that a zebra lives longer than 32.2 years.

☐ c) There is about a 2.35% chance that a zebra lives longer than 32.2 years.

☐ d) There is about a 0.15% chance that a zebra lives longer than 32.2 years.

9. The life span of seals in a particular zoo are normally distributed. The average seal lives 13.8 years; the standard deviation is 3.2 years. What is the probability that a seal lives longer than 7.4 years?

☐ a) There is about a 2.5% chance that a seal lives longer than 7.4 years

☐ b) There is about a 13.5% chance that a seal lives longer than 7.4 years

☐ c) There is about a 86.5% chance that a seal lives longer than 7.4 years

☐ d) There is about a 97.5% chance that a seal lives longer than 7.4 years

10. SAT scores are normally distributed. The mean SAT score in 2019 was 1059 and the standard deviation was 210. Suppose an elite school only considers applicants who score in the top 2.5% (They must score higher than 97.5% of test takers). What is the minimum SAT score needed to apply to this elite school?

☐ a) 1269

☐ b) 1479

☐ c) 1589

☐ d) 1529

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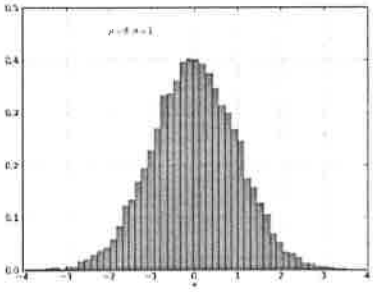

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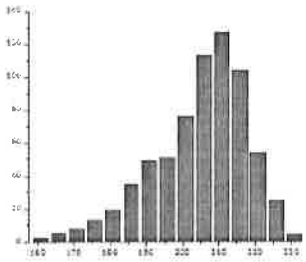

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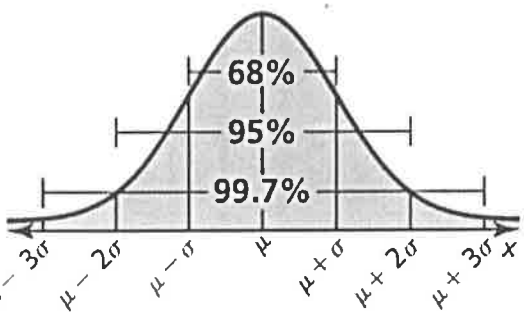

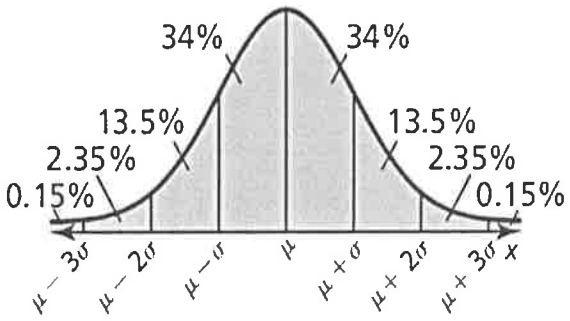

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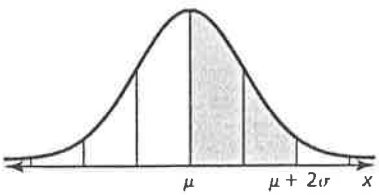

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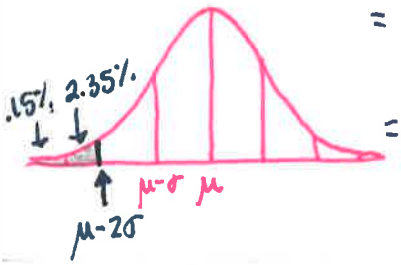


= 2.5%

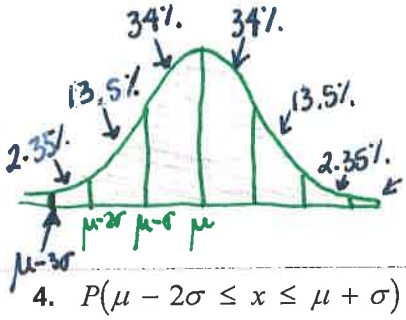
(or)

= .0015 + .0235

= **.025**

2. $P(x \geq \mu - 3\sigma)$ = 2.35% + 13.5% + 34% + 34% + 13.5% + 2.35% + .15%

= 99.85%



(or)

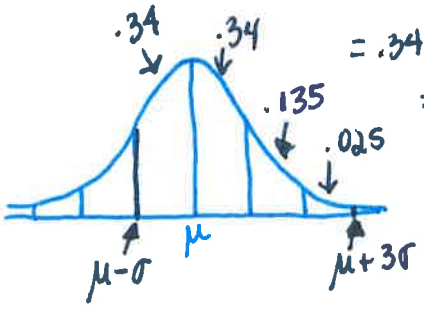
= .0235 + .135 + .34 + .34 + .135 + .0235 + .0015

= **.9985**

(or)

= 1 − .0015 = **.9985**

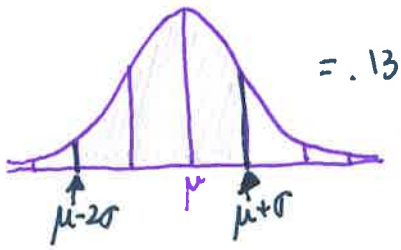
3. $P(\mu - \sigma \leq x \leq \mu + 3\sigma)$



= .34 + .34 + .135 + .0235

= **.8385**

4. $P(\mu - 2\sigma \leq x \leq \mu + \sigma)$



= .135 + .34 + .34

= **.815**

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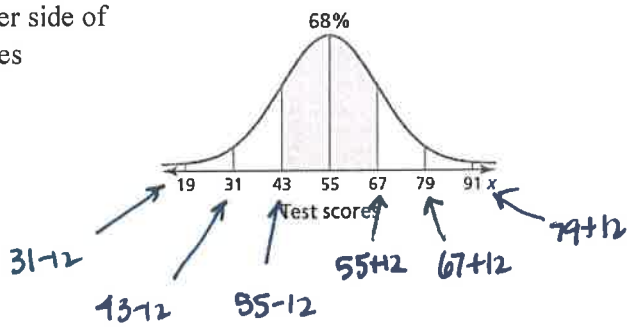
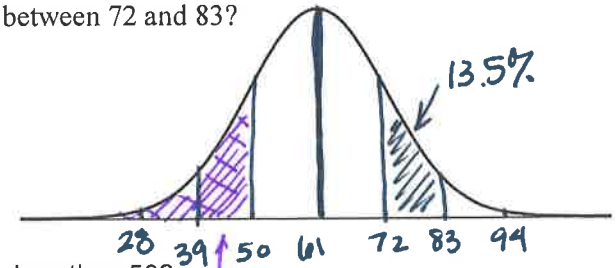


5. The scores for a math course test are normally distributed with a mean of 61 and a standard deviation of 11. The test scores range from 0 to 100.

   a. About what percent of the students taking the test have scores between 72 and 83?

   $P(72 < x < 83)$ = **13.5%**



   b. About what percent of the students taking the test have scores less than 50?

   $P(x < 50)$ = .15% + 2.35% + 13.5%

   = **16%**