

Student: \_\_\_\_\_  
Date: \_\_\_\_\_

Instructor: Andreas Lazari  
Course: Math2620 F - Fall 2018

Assignment: Chapter 3.2-Homework

1. Find the sample variance and standard deviation.

use TI83/4.

20, 15, 4, 9, 10

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Type an integer or a decimal. Do not round.)

- A.  $s^2 = 37.3$   
 B.  $\sigma^2 =$  \_\_\_\_\_

$$s = 6.107372 \approx 6.1$$
$$s^2 = (6.107372)^2 = 37.29999 \approx 37.3$$

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Round to one decimal place as needed.)

- A.  $\sigma =$  \_\_\_\_\_  
 B.  $s = 6.1$

2. Find the population variance and standard deviation.

9, 18, 30, 36, 42

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Type an integer or a decimal. Do not round.)

- A.  $s^2 =$  \_\_\_\_\_  
 B.  $\sigma^2 = 144$

use TI83/84

$$\sigma = 12$$
$$\sigma^2 = (12)^2 = 144$$

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Type an integer or a decimal. Do not round.)

- A.  $s =$  \_\_\_\_\_  
 B.  $\sigma = 12$

3. Find the sample variance and standard deviation.

4, 55, 14, 48, 37, 23, 34, 31, 26, 26

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Round to two decimal places as needed.)

- A.  $s^2 = 225.29$   
 B.  $\sigma^2 =$  \_\_\_\_\_

use TI83/84

$$s = 15.009626$$
$$s^2 = (15.009626)^2 = 225.2888 \approx 225.29$$

Choose the correct answer below. Fill in the answer box to complete your choice.  
(Round to one decimal place as needed.)

- A.  $\sigma =$  \_\_\_\_\_  
 B.  $s = 15.0$

4. An insurance company crashed four cars in succession at 5 miles per hour. The cost of repair for each of the four crashes was \$416, \$460, \$416, \$236. Compute the range, sample variance, and sample standard deviation cost of repair.

The range is \$ 224.

$$\text{Range: } 460 - 236 = 224$$

$s^2 =$  9904 dollars<sup>2</sup>  
(Round to the nearest whole number as needed.)

$$s = 99.51884 \approx 99.52$$

$s =$  \$ 99.52  
(Round to two decimal places as needed.)

$$s^2 = (99.51884)^2 = 9903.999515 \approx 9904$$

5. Compute the range and sample standard deviation for strength of the concrete (in psi).

3940, 4050, 3100, 3000, 2990, 3840, 4050, 4030

$$\text{Range: } 4050 - 2990 = 1060$$

The range is 1060 psi.

$$s = 498.598034 \approx 498.6$$

$s =$  498.6 psi (Round to one decimal place as needed.)

6. The following data represent the flight time (in minutes) of a random sample of seven flights from one city to another city.

284, 270, 260, 266, 257, 263, 269

Compute the range and sample standard deviation of flight time.

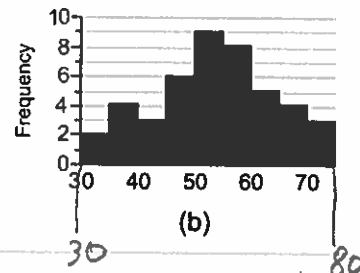
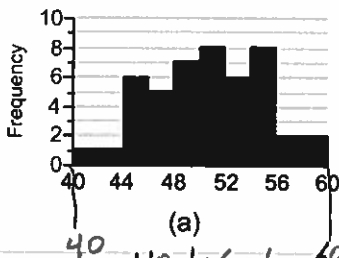
$$\text{Range: } 284 - 257 = 27$$

The range of flight time is 27 minutes.

$$s = 8.8317608 \approx 8.8$$

The sample standard deviation of flight time is 8.8 minutes.  
(Type an integer or decimal rounded to one decimal place as needed.)

7. Which histogram depicts a higher standard deviation?

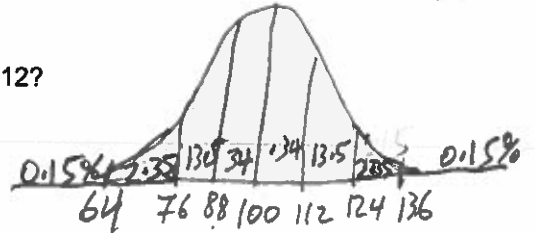


Choose the correct answer below.

- A. Histogram b depicts the higher standard deviation, since it is more bell shaped.
- B. Histogram b depicts the higher standard deviation, because the distribution has more dispersion.
- C. Histogram a depicts the higher standard deviation, because the distribution has more dispersion.
- D. Histogram a depicts the higher standard deviation, because the bars are higher than the average bar in b.

8. Scores of an IQ test have a bell-shaped distribution with a mean of 100 and a standard deviation of 12. Use the empirical rule to determine the following.

- (a) What percentage of people has an IQ score between 88 and 112?  
 (b) What percentage of people has an IQ score less than 88 or greater than 112?  
 (c) What percentage of people has an IQ score greater than 112?



(a) 68 % (Type an integer or a decimal.)

(b) 32 % (Type an integer or a decimal.)

(c) 16 % (Type an integer or a decimal.)

a)  $(88 + 112) \rightarrow 68\%$   
 b)  $< 88 + > 112 = 16\% + 16\% = 32\%$

9. A certain standardized test's math scores have a bell-shaped distribution with a mean of 525 and a standard deviation of 119. Complete parts (a) through (c).

(a) What percentage of standardized test scores is between 168 and 882?

99.7 % (Round to one decimal place as needed.)

$z = \frac{168 - 525}{119} = -3$  and  $z = \frac{882 - 525}{119} = 3$   
 From (168 to 882)  $\rightarrow 99.7\%$

(b) What percentage of standardized test scores is less than 168 or greater than 882?

0.3 % (Round to one decimal place as needed.)

$< 168$  or  $> 882$   
 $.15 + .15 = .3$   
 or  $100 - 99.7 = .3$

(c) What percentage of standardized test scores is greater than 763?

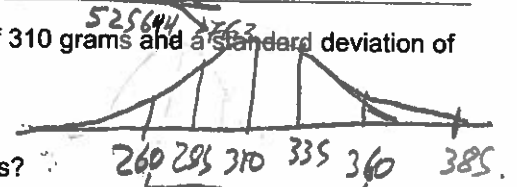
2.5 % (Round to one decimal place as needed.)

$> 763 \rightarrow 2.5\%$



10. The weight of an organ in adult males has a bell-shaped distribution with a mean of 310 grams and a standard deviation of 25 grams. Use the empirical rule to determine the following.

- (a) About 95% of organs will be between what weights?  
 (b) What percentage of organs weighs between 285 grams and 335 grams?  
 (c) What percentage of organs weighs less than 285 grams or more than 335 grams?  
 (d) What percentage of organs weighs between 260 grams and 385 grams?



(a) 260 and 360 grams (Use ascending order.)

(b) 68 % (Type an integer or a decimal.)

(c) 32 % (Type an integer or a decimal.)

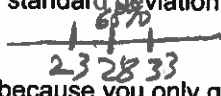
(d) 97.35 % (Type an integer or decimal rounded to two decimal places as needed.)

a) 95% from 260 to 360  
 b) 68% from 285 to 335

c)  $< 285$  or  $> 335 \Rightarrow 16\% + 16\% = 32\%$

d)  $260$  to  $310$  is  $47.5$   
 $310$  to  $385$  is  $49.85$   
97.35

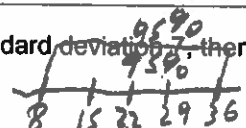
11. If a variable has a distribution that is bell-shaped with mean 28 and standard deviation 5, then according to the Empirical Rule, 68.0% of the data will lie between which values?



(This is a reading assessment question. Be certain of your answer because you only get one attempt on this question.)

According to the Empirical Rule, 68.0% of the data will lie between 23 and 33.  
 (Type integers or decimals rounded to two decimal places as needed. Use ascending order.)

12. If a variable has a distribution that is bell-shaped with mean 22 and standard deviation 7, then according to the Empirical Rule, what percent of the data will lie between 8 and 36?



(This is a reading assessment question. Be certain of your answer because you only get one attempt on this question.)

According to the Empirical Rule, 95 % of the data will lie between 8 and 36.  
 (Type an integer or a decimal. Do not round.)

13. The mean of the commute time to work for a resident of a certain city is 27.8 minutes. Assume that the standard deviation of the commute time is 7.1 minutes to complete parts (a) and (b). *use Chebyshev's Theorem.*

(a) What minimum percentage of commuters in the city has a commute time within 2 standard deviations of the mean?

75 % (Type an integer or a decimal.)

a)  $1 - \frac{1}{2^2} = 1 - \frac{1}{4} = .75$  or 75%

(b) What is the minimum percentage of commuters who have commute times between 6.5 minutes and 49.1 minutes?

88.9 % (Round to the nearest tenth as needed.)

b)  $1 - \frac{1}{3^2} = 1 - \frac{1}{9} = .8889$   
 or 88.89%  
 $z = \frac{49.1 - 27.8}{7.1}$   
 Diagram: A number line with mean 27.8. Points 6.5 and 49.1 are marked. The interval between 6.5 and 49.1 is shaded, with a label "88.89%".

14. At one point the average price of regular unleaded gasoline was \$3.54 per gallon. Assume that the standard deviation price per gallon is \$0.04 per gallon and use Chebyshev's inequality to answer the following.

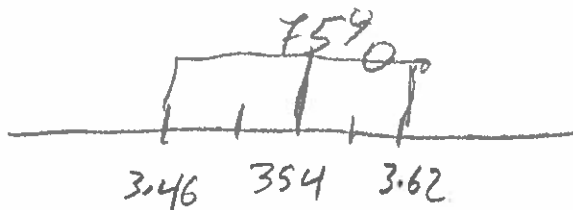
(a) What percentage of gasoline stations had prices within 3 standard deviations of the mean?

(b) What is the minimum percentage of gasoline stations that had prices between \$3.46 and \$3.62?

(a) At least 88.89 % of gasoline stations had prices within 3 standard deviations of the mean. (Round to the nearest hundredth as needed.)

(b) 75 % is the minimum percentage of gasoline stations that had prices between \$3.46 and \$3.62. (Round to the nearest hundredth as needed.)

a)  $1 - \frac{1}{3^2} = 1 - \frac{1}{9} = \frac{8}{9} = .8889$   
 or 88.89%



within 2 standard deviations

1. A.  $s^2 = \underline{37.3}$

B.  $s = \underline{6.1}$

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2. B.  $\sigma^2 = \underline{144}$

B.  $\sigma = \underline{12}$

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3. A.  $s^2 = \underline{225.29}$

B.  $s = \underline{15.0}$

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4. 224

9,904

99.52

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5. 1060

498.6

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6. 27

8.8

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7. B. Histogram b depicts the higher standard deviation, because the distribution has more dispersion.

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8. 68

32

16

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9. 99.7

0.3

2.5

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10. 260

360

68

32

97.35

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11. 23

33

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12. 95

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13. 75

88.9

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14. 88.89

75

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