Final Exam (ADA) (Exam)

INSTRUCTOR
Donna Weixelman
American Public University System

Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	
POINTS	1.56/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	-

TOTAL SCORE

1.56/100 | 1.6%

Due Date

TUE, DEC 1, 2020
11:59 PM EST

Request Extension

Instructions

You have 2 attempts and it will take the best score. The exam must be done in one sitting.

Description

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

1. **[1.56/6.25 Points]** DETAILS PREVIOUS ANSWERS **BBBASICSTAT8ACC 5.2.021.MI.**

MY NOTES ASK YOUR TEACHER

The following question involves a standard deck of 52 playing cards. In such a deck of cards there are four suits of 13 cards each. The four suits are: hearts, diamonds, clubs, and spades. The 26 cards included in hearts and diamonds are red. The 26 cards included in clubs and spades are black. The 13 cards in each suit are: 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King, and Ace. This means there are four Aces, four Kings, four Queens, four 10s, etc., down to four 2s in each deck.

You draw two cards from a standard deck of 52 cards without replacing the first one before drawing the second.

(a) Are the outcomes on the two cards independent? Why?

- ○ Yes. The probability of drawing a specific second card is the same regardless of the identity of the first drawn card.
- ○ No. The events cannot occur together.
- ○ Yes. The events can occur together.
- ◉ No. The probability of drawing a specific second card depends on the identity of the first card. ✔

(b) Find P(ace on 1st card *and* king on 2nd). (Enter your answer as a fraction.)

[ ]

(c) Find P(king on 1st card *and* ace on 2nd). (Enter your answer as a fraction.)

[ ]

(d) Find the probability of drawing an ace *and* a king in either order. (Enter your answer as a fraction.)

[ ]

2. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 7.3.011.MI.DEFECTIVE** MY NOTES ASK YOUR TEACHER

Assume that x has a normal distribution with the specified mean and standard deviation. Find the indicated probability. (Enter a number. Round your answer to four decimal places.)

$\mu = 20$; $\sigma = 4.4$

$P(x \geq 30) =$ [ ]

3. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 5.1.017. MY NOTES ASK YOUR TEACHER

Isabel Briggs Myers was a pioneer in the study of personality types. The personality types are broadly defined according to four main preferences. Do married couples choose similar or different personality types in their mates? The following data give an indication.

Similarities and Differences in a Random Sample of 375 Married Couples

Number of Similar Preferences	Number of Married Couples
All four	26
Three	129
Two	113
One	69
None	38

Suppose that a married couple is selected at random.

(a) Use the data to estimate the probability that they will have 0, 1, 2, 3, or 4 personality preferences in common. (For each answer, enter a number. Enter your answers to 2 decimal places.)

0	1	2	3	4

(b) Do the probabilities add up to 1? Why should they?

- ○ Yes, because they do not cover the entire sample space.
- ○ No, because they do not cover the entire sample space.
- ○ Yes, because they cover the entire sample space.
- ○ No, because they cover the entire sample space.

What is the sample space in this problem?

- ○ 0, 1, 2, 3 personality preferences in common
- ○ 1, 2, 3, 4 personality preferences in common
- ○ 0, 1, 2, 3, 4, 5 personality preferences in common
- ○ 0, 1, 2, 3, 4 personality preferences in common

4. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 6.2.019.MI.** MY NOTES ASK YOUR TEACHER

Sociologists say that 85% of married women claim that their husband's mother is the biggest bone of contention in their marriages (sex and money are lower-rated areas of contention). Suppose that seven married women are having coffee together one morning. Find the following probabilities. (For each answer, enter a number. Round your answers to three decimal places.)

(a) All of them dislike their mother-in-law.

(b) None of them dislike their mother-in-law.

(c) At least five of them dislike their mother-in-law.

(d) No more than four of them dislike their mother-in-law.

5. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 1.1.011. MY NOTES ASK YOUR TEACHER

Categorize these measurements associated with student life according to level: nominal, ordinal, interval, or ratio.

(a) Length of time to complete an exam

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

(b) Time of first class

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

(c) Major field of study

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

(d) Course evaluation scale: poor, acceptable, good

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

(e) Score on last exam (based on 100 possible points)

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

(f) Age of student

- ○ nominal
- ○ ordinal
- ○ interval
- ○ ratio

6. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 5.3.013.MI.** MY NOTES ASK YOUR TEACHER

Compute $P_{5,4}$. (Enter an exact number.)

7. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 7.3.005.MI.** MY NOTES ASK YOUR TEACHER

Assume that x has a normal distribution with the specified mean and standard deviation. Find the indicated probability. (Enter a number. Round your answer to four decimal places.)

$\mu = 4$; $\sigma = 2$

$P(3 \le x \le 6) =$

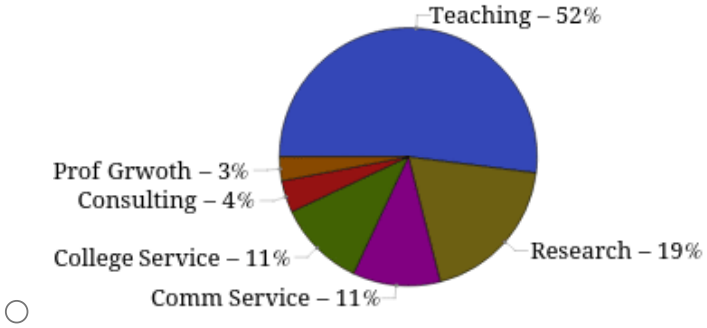
8. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 7.2.008.** MY NOTES ASK YOUR TEACHER

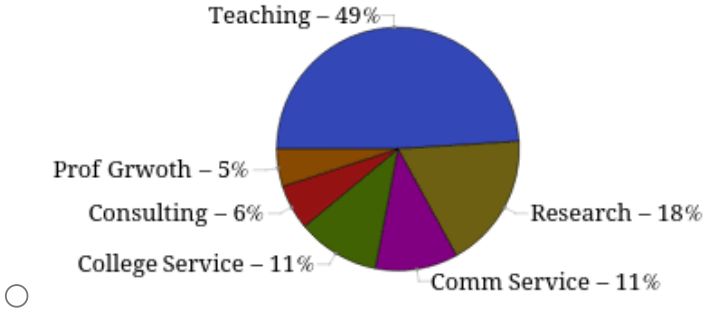
Raul received a score of 73 on a history test for which the class mean was 70 with a standard deviation of 8. He received a score of 72 on a biology test for which the class mean was 70 with standard deviation 6. On which test did he do better relative to the rest of the class?

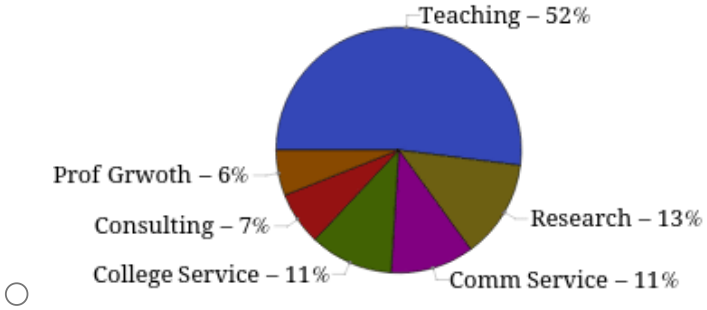
- biology test
- history test
- the same

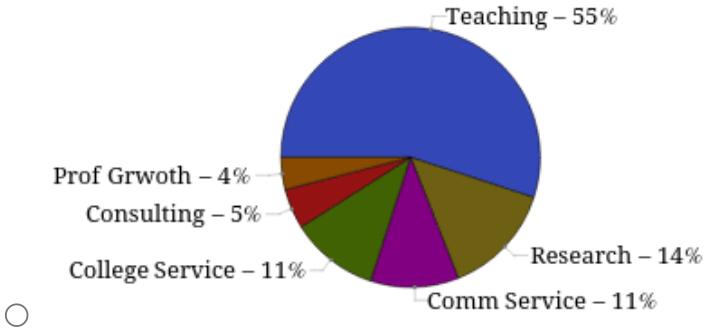
9. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 2.2.010. MY NOTES ASK YOUR TEACHER

How do college professors spend their time? *The National Education Association Almanac of Higher Education* gives the following average distribution of professional time allocation: teaching, 52%; research, 19%; professional growth, 3%; community service, 11%; service to the college, 11%; and consulting outside the college, 4%. Make a pie chart showing the allocation of professional time for college professors. (Select the correct graph.)









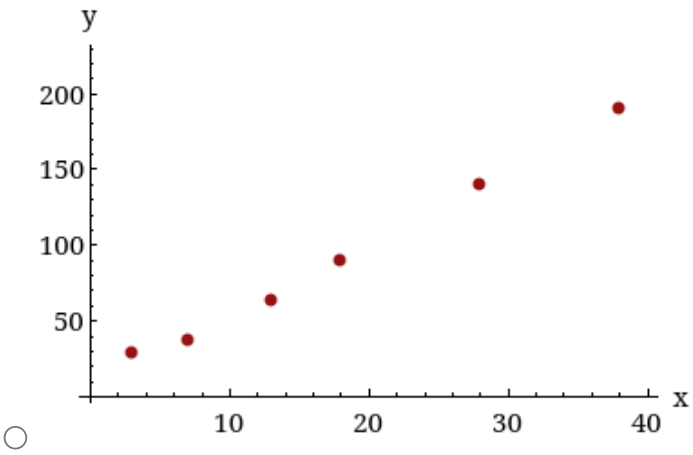
10. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 4.2.008. MY NOTES ASK YOUR TEACHER

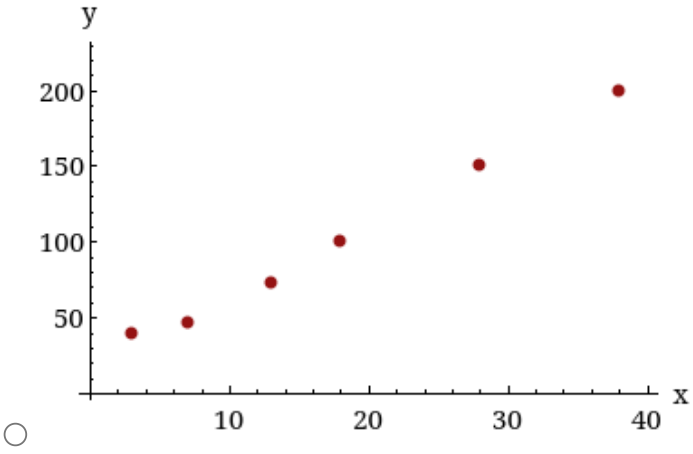
You are the foreman of the Bar-S cattle ranch in Colorado. A neighboring ranch has calves for sale, and you are going to buy some calves to add to the Bar-S herd. How much should a healthy calf weigh? Let x be the age of the calf (in weeks), and let y be the weight of the calf (in kilograms).

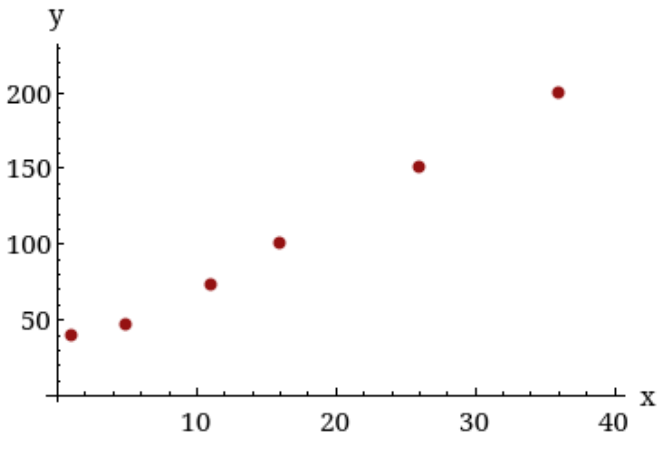
x	1	5	11	16	26	36
y	39	47	73	100	150	200

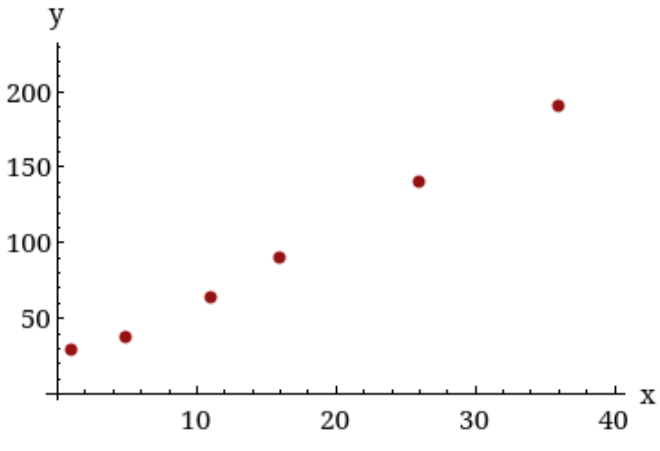
Complete parts (a) through (e), given $\Sigma x = 95$, $\Sigma y = 609$, $\Sigma x^2 = 2375$, $\Sigma y^2 = 81{,}559$, $\Sigma x\,y = 13{,}777$, and $r \approx 0.997$.

(a) Make a scatter diagram of the data. (Select the correct graph.)









(b) Verify the given sums Σx, Σy, Σx^2, Σy^2, $\Sigma x\,y$, and the value of the sample correlation coefficient r. (For each answer, enter a number. Round your value for r to three decimal places.)

$\Sigma x =$ ☐

$\Sigma y =$ ☐

$\Sigma x^2 =$ ☐

$\Sigma y^2 =$ ☐

$\Sigma x\,y =$ ☐

$r =$ ☐

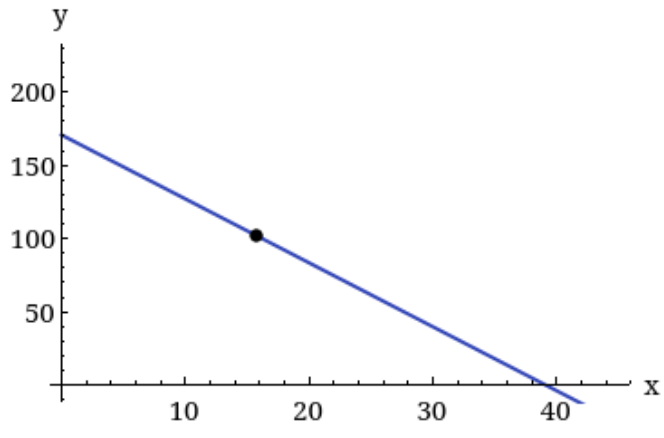
(c) Find $\overline{x}$, and $\overline{y}$. Then find the equation of the least-squares line $\hat{y} = a + b\,x$. (For each answer, enter a number. Round your answers for $\overline{x}$ and $\overline{y}$ to two decimal places. Round your answers for a and b to three decimal places.)

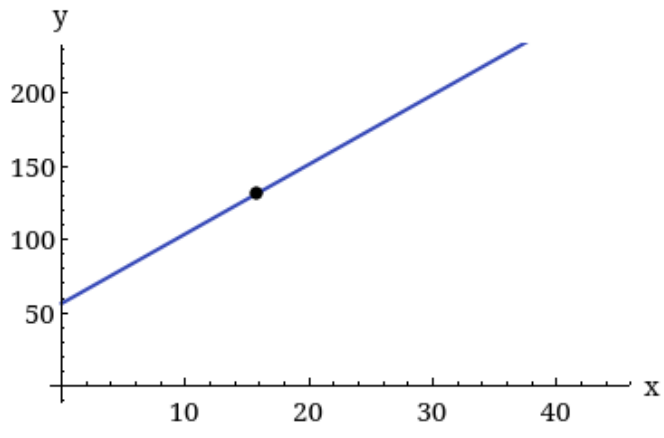
$\overline{x} =$ ☐

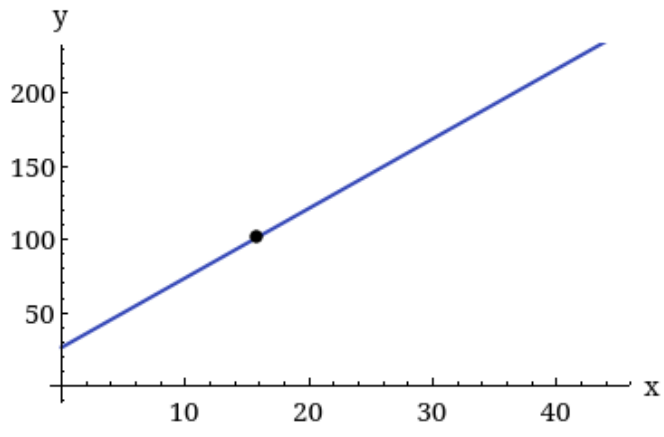
$\overline{y} =$ ☐

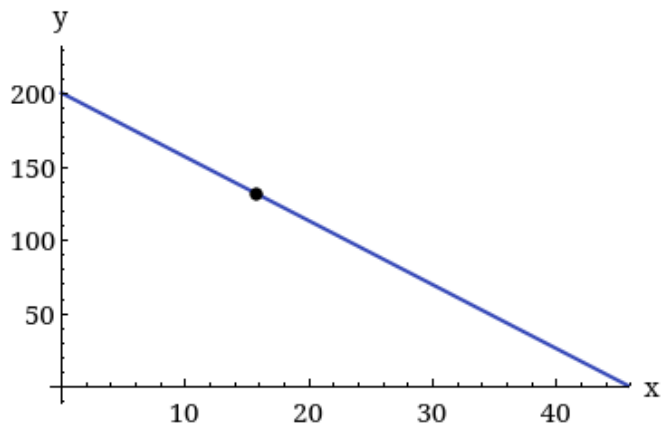
$\hat{y} =$ ☐ + ☐ x

(d) Graph the least-squares line. Be sure to plot the point $(\overline{x}, \overline{y})$ as a point on the line. (Select the correct graph.)









(e) Find the value of the coefficient of determination r^2. What percentage of the variation in y can be *explained* by the corresponding variation in x and the least-squares line? What percentage is *unexplained*? (For each answer, enter a number.

Round your answer for r^2 to three decimal places. Round your answers for the percentages to one decimal place.)

r^2 = [ ]

explained = [ ] %

unexplained = [ ] %

(f) The calves you want to buy are 22 weeks old. What does the least-squares line predict for a healthy weight (in kg)? (Enter a number. Round your answer to two decimal places.)

[ ] kg

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11. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 3.1.005.MI.** MY NOTES ASK YOUR TEACHER

Find the mean, median, and mode of the data set.

9 2 6 2 4

mean (Enter a number.) [ ]

median (Enter an exact number.) [ ]

mode (Enter an exact number.) [ ]

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12. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 7.2.017.MI.** MY NOTES ASK YOUR TEACHER

Sketch the area under the standard normal curve over the indicated interval and find the specified area. (Enter a number. Round your answer to four decimal places.)

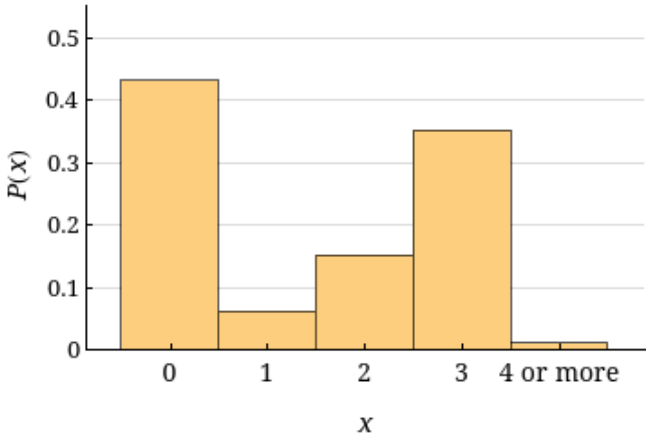
The area to the left of z = 0.54 is [ ] .

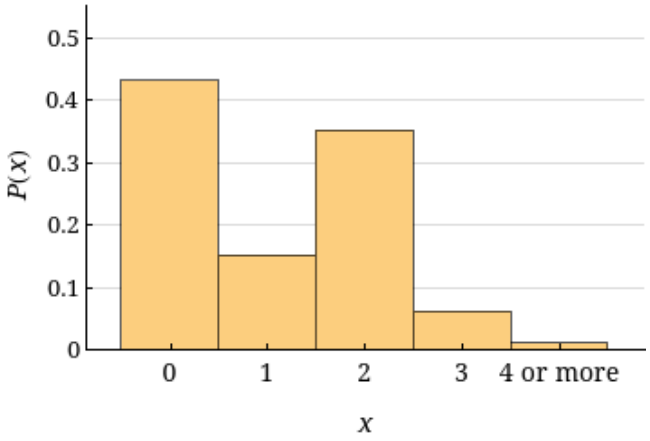
13. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 6.1.013.MI. MY NOTES ASK YOUR TEACHER

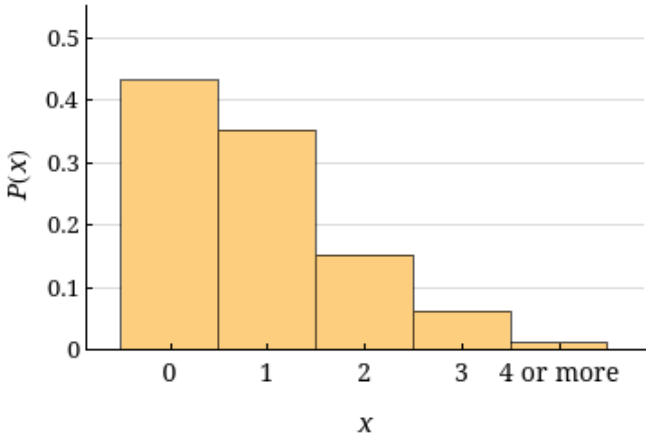
A particular lake is known to be one of the best places to catch a certain type of fish. In this table, x = number of fish caught in a 6-hour period. The percentage data are the percentages of fishermen who caught x fish in a 6-hour period while fishing from shore.

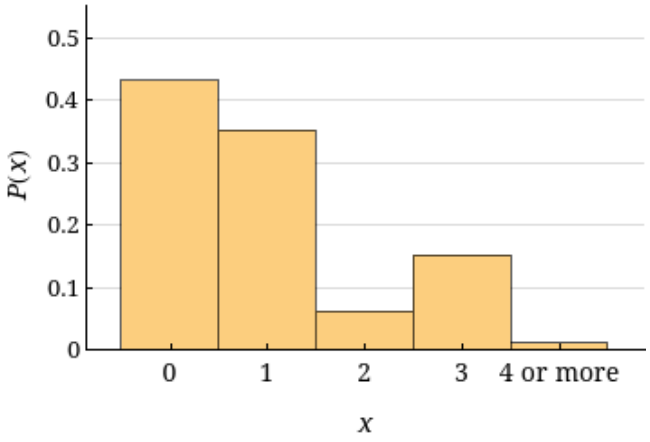
x	0	1	2	3	4 or more
%	43%	35%	15%	6%	1%

(a) Convert the percentages to probabilities and make a histogram of the probability distribution. (Select the correct graph.)









(b) Find the probability that a fisherman selected at random fishing from shore catches one or more fish in a 6-hour period. (Enter a number. Round your answer to two decimal places.)

(c) Find the probability that a fisherman selected at random fishing from shore catches two or more fish in a 6-hour period. (Enter a number. Round your answer to two decimal places.)

(d) Compute μ, the expected value of the number of fish caught per fisherman in a 6-hour period (round 4 or more to 4). (Enter a number. Round your answer to two decimal places.)

$\mu =$ fish

(e) Compute σ, the standard deviation of the number of fish caught per fisherman in a 6-hour period (round 4 or more to 4). (Enter a number. Round your answer to three decimal places.)

$\sigma =$ fish

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14. **[–/6.25 Points]** DETAILS **BBBASICSTAT8ACC 3.2.005.MI.** MY NOTES ASK YOUR TEACHER

Consider the data set.

2, 3, 4, 6, 8

(a) Find the range. (Enter an exact number.)

(b) Use the defining formula to compute the sample standard deviation s. (Enter a number. Round your answer to two decimal places.)

(c) Use the defining formula to compute the population standard deviation σ. (Enter a number. Round your answer to two decimal places.)

15. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 8.1.018.MI. MY NOTES ASK YOUR TEACHER

What price do farmers get for their watermelon crops? In the third week of July, a random sample of 41 farming regions gave a sample mean of $\bar{x}$ = $6.88 per 100 pounds of watermelon. Assume that σ is known to be $1.90 per 100 pounds.

(a) Find a 90% confidence interval for the population mean price (per 100 pounds) that farmers in this region get for their watermelon crop (in dollars). What is the margin of error (in dollars)? (For each answer, enter a number. Round your answers to two decimal places.)

lower limit $ ☐
upper limit $ ☐
margin of error $ ☐

(b) Find the sample size necessary for a 90% confidence level with maximal error of estimate E = 0.37 for the mean price per 100 pounds of watermelon. (Enter a number. Round up to the nearest whole number.)

☐ farming regions

(c) A farm brings 15 tons of watermelon to market. Find a 90% confidence interval for the population mean cash value of this crop (in dollars). What is the margin of error (in dollars)? *Hint:* 1 ton is 2000 pounds. (For each answer, enter a number. Round your answers to two decimal places.)

lower limit $ ☐
upper limit $ ☐
margin of error $ ☐

16. [–/6.25 Points] DETAILS BBBASICSTAT8ACC 5.3.017.MI. MY NOTES ASK YOUR TEACHER

Compute $C_{5,3}$. (Enter an exact number.)

☐

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