Level 3: Statistics and Probability Midtest Answer Key

Question 1:

John, a biologist at the zoo, wants to know if there is a correlation between the population of perch and walleye fish in a pond.

What does it mean for a correlation to exist?

a. Factors that cause one population to increase will cause the other population to increase.

b. One population affects the other population.

c. Factors that cause one population to increase will cause the other population to decrease.

d. There is a link between the two populations.

Question 2:

Mel caught fish at each of her favorite fishing spots on a lake. Her favorite fishing spots are shown as fish symbols on the map below.

She caught 18 fish. Of the 18 fish, 6 were pike and 12 were sunfish.

Which statement **most likely** is true?

a. Most of the fish in the lake live in the coves.

b. Most of the fish in the lake are either pike or sunfish.

c. There are about twice as many sunfish in the lake as there are pike.

d. Conclusions about fish in the lake may not be valid because the sample is not representative.

Continue

Question 3:

Ellen is studying the behavior of two types of monkeys.

Which step will have the **greatest** effect on the accuracy of conclusions she makes from her study?

a. having at least two researchers record each observation

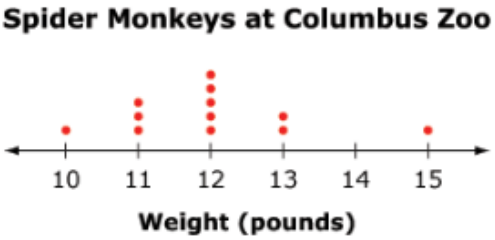
b. observing the monkeys at the same time every day

c. using the same sample size for each type of monkey

d. making sure the samples are representative of each population

Question 4:

This dot plot shows the weight, in pounds, of spider monkeys at the Columbus Zoo.



At the Springfield Zoo, the mean absolute deviation of the spider monkey weights is 0.5.

What is the difference between the mean absolute deviations at the two zoos?

a. 0.33

b. 0.83

c. 9.5

d. 11.5

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Question 5:

Jasmine wants to estimate the average number of rides people ride at her county fair.

Which of the following methods uses random sampling?

a. Count tickets from every ride and divide by the number of people who attended the fair.

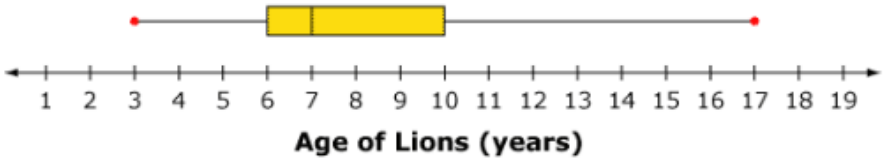
b. Ask every fourth person standing in line for the most popular ride.

c. Stand at the gate and ask every 20th person who leaves the fairgrounds.

d. Compare the number of rides at the last 3 fairs to the number of people who attended each fair.

Question 6:

The box plot shows the ages of the lions at Wildlife Safari Park.



Within which age range are the data points closest together?

a. 3 to 6 years

b. 6 to 7 years

c. 7 to 10 years

d. 10 to 17 years

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Question 7:

Researchers conducted a study to determine the effect of vitamins on the growth of tiger cubs during their first year. They studied tigers at three different zoos. The table and the graph show the mean weight of the tigers after one year.

Mean Weight of One-Year-Old Tigers

Zoo	Mean Weight (pounds)	
	With Vitamins	Without Vitamins
Wild Kingdom	308	300
Safari Village	312	308
Jungle Park	304	301

The company that makes the vitamins wants a bar graph to show that giving the vitamins results in larger adult tigers.

Which scale for the *y*-axis will make the differences in weight appear largest?

a. 0–325

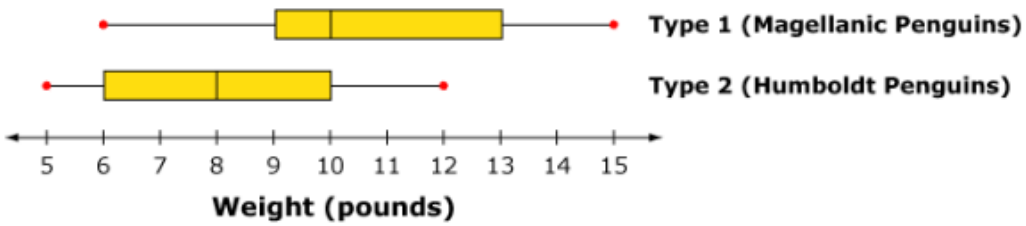
b. 100–325

c. 200–325

d. 300–325

Question 8:

The box plots summarize the weights of two types of penguins.



Which data set shows more variablility and why?

a. the data set for Type 2 because its minimum value is less than the minimum value for Type 1

b. the data set for Type 2 because its interquartile range is larger than the interquartile range for Type 1

c. the data set for Type 1 because the median is greater than the median for Type 2

d. the data set for Type 1 because the range is greater than the range for Type 2

Continue

Question 9:

The teachers at Smith School took 287 students on a field trip to the zoo. The education director at the zoo asked a random sample of 60 Smith School students to identify their favorite exhibit. The table displays the data.

Favorite Exhibits

Exhibit	Number of Students
Aviary Sanctuary	1
Monkey House	6
North American Exhibit	2
Parakeet Landing	3
Penguin Pool	5
Reptile House	0
Safari Sky Ride	25
Snow Leopard Cubs	8
Tiger Mountain	10

Which statement is **best** supported by the data?

a. Exactly $\frac{1}{6}$ of the students from Smith School like Tiger Mountain best.

b. There are no students from Smith School who like the Reptile House best.

c. There are probably more Smith School students who like the Snow Leopard Cubs best than those who like the Monkey House best.

d. There are probably more Smith School students who like the Safari Sky Ride best than those who like Tiger Mountain best.

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Question 10:

Aiden works at the aquarium. He surveyed a random sample of 300 visitors to find out their favorite exhibits. The results are shown in the table.

Favorite Exhibits

Exhibit	Number of Votes
Seahorses	41
Penguins	115
Shark Tank	130
Pond Life	14

If 4,500 people visited the aquarium, what is the best estimate of the number who liked the penguin exhibit best?

a. 1,125

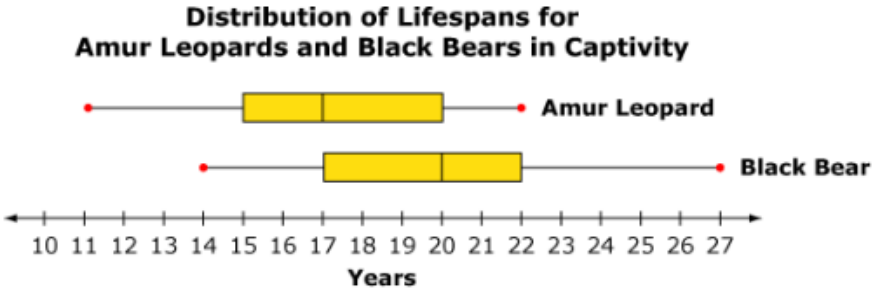
b. 1,500

c. 1,725

d. 2,800

Question 11:

Janice made box plots to show the distribution of lifetimes for adult Amur leopards and black bears in captivity.



What is the estimated overlap in the distribution of lifetimes for adult Amur leopards and black bears?

a. 11–27 years

b. 14–22 years

c. 15–22 years

d. 17–20 years

e 22–27 years

Continue

Question 12:

The table shows statistics about the ages, in years, of female lions at four zoos.

Age of Female Lions, in Years, at Four Zoos

Statistic	Wildlife Safari	Animal Kingdom	Big Game Park	Highland Zoo
Mean	7.0	6.4	9.2	7.2
Median	5	6	7	7
Mean Absolute Deviation	5.2	3.68	5.84	1.04

Each zoo has 5 female lions. Female lions breed from age 4 through 10 years.

Which zoo has the **most** female lions within the breeding age range?

a. Wildlife Safari

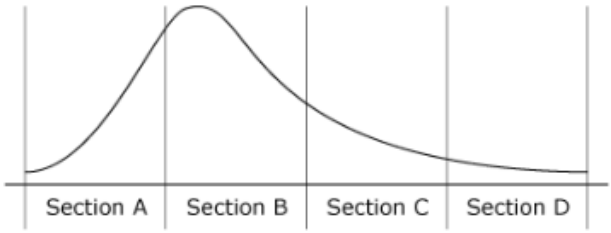
b. Animal Kingdom

c. Big Game Park

d. Highland Zoo

Question 13:

The graph below shows the distribution of values for a population trait. The graph is divided into four equal sections.



Which section of the graph contains values that are the **least** reliable for describing the population?

a. Section A

b. Section B

c. Section C

d. Section D

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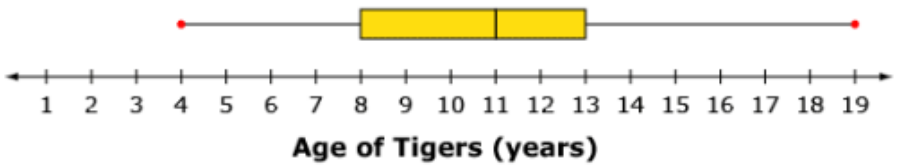
Question 14:

The box plot shows the ages of the tigers at Columbus Zoo.



Within which age range are the data points closest together?

a. 4 to 8 years

b. 8 to 11 years

c. 11 to 13 years

d. 13 to 19 years

Question 15:

To estimate the gelada baboon population in the Simien Mountain National Park, researchers tagged 200 gelada baboons. Three months later, the researchers used random sampling to count the gelada baboons. They counted 1,500 gelada baboon, 40 of which were tagged.

What is the **best** estimate of the gelada baboon population?

7,500 gelada baboons

Question 16:

The box plots summarize the weights of two types of parrots.

Which data set shows more variability and why?

a. the data for Blue and Gold parrots because the minimum value is less than the minimum value for Green-Winged parrots

b. the data for Blue and Gold parrots because the interquartile range is larger than the interquartile range for Green-Winged parrots

c. the data for Green-Winged parrots because the median is greater than the median for Blue and Gold parrots

d. the data for Green-Winged parrots because the range is greater than the range for Blue and Gold parrots

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