Probability & Statistics Final Exam

krista king
MATH

Probability & Statistics Final Exam

This exam is comprehensive over the entire course and includes 12 questions. You have 60 minutes to complete the exam.

The exam is worth 100 points. The 8 multiple choice questions are worth 5 points each (40 points total) and the 4 free response questions are worth 15 points each (60 points total).

Mark your multiple choice answers on this cover page. For the free response questions, show your work and make sure to circle your final answer.

1. (5 pts) A B C D E

2. (5 pts) A B C D E

3. (5 pts) A B C D E

4. (5 pts) A B C D E

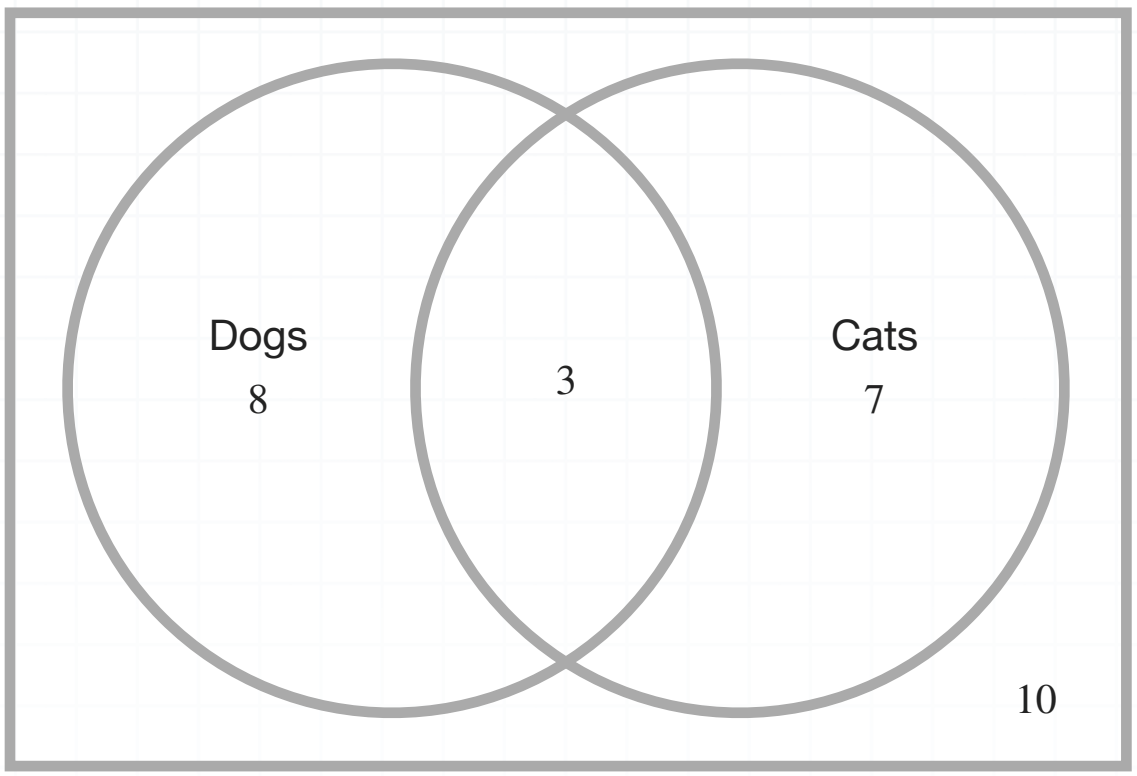
5. (5 pts) A B C D E

6. (5 pts) A B C D E

7. (5 pts) A B C D E

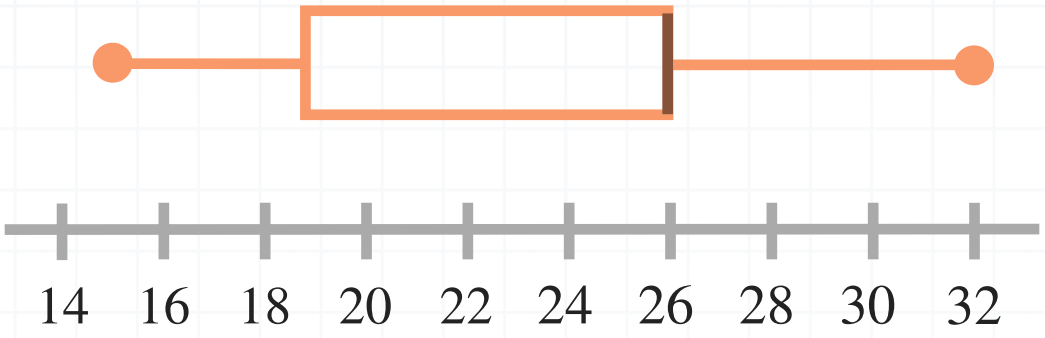
8. (5 pts) A B C D E

1. **(5 pts)** A group of elementary students were asked if they have certain types of pets at home. The results of the survey are in the Venn diagram. How many elementary students were surveyed?



A	3	C	8	E	28
B	7	D	10		

2. **(5 pts)** Which data set is represented in the box-and-whisker plot?



A 15, 26, 19, 17, 26, 28, 32

B 15, 17, 19, 26, 26, 32, 26

C 19, 19, 15, 26, 32, 26, 26

D 19, 19, 15, 26, 32, 26, 28

E 19, 16, 15, 26, 32, 26, 29

3. **(5 pts)** Suppose $27\,\%$ of our nation's high school students play a brass instrument. If we select students at random and ask them if they play a brass instrument, what's the probability that we'll need to ask exactly 4 people to find someone who is plays a brass instrument?

A	0.0144	D	0.1050
B	0.1971	E	0.0767
C	0.3890		

4. **(5 pts)** Suppose a six-sided die is rolled twice and the two values are added together. What is the probability that the sum of two dice is 7?

A	$\frac{1}{6}$	C	$\frac{1}{4}$	E	$\frac{1}{2}$
B	$\frac{7}{36}$	D	$\frac{7}{18}$		

5. **(5 pts)** There are 100 raffle tickets sold at a fundraiser, at which three $\$200$ prizes will be given away. How many ways can the prizes be distributed?

A	$4{,}950$	C	$161{,}700$	E	$3{,}921{,}225$
B	$147{,}440$	D	$1{,}313{,}400$		

6. **(5 pts)** The mean finishing time for the first eight places of the 200M women's single kayak race during the 2016 Olympic games was 40.759 seconds, with a standard deviation of 0.55 seconds. Assuming the data is normally distributed, what is the maximum time in which a kayaker can finish if she wants to be faster than $97\,\%$ of her competitors?

A	41.800 seconds	D	39.720 seconds
B	40.794 seconds	E	39.270 seconds
C	39.970 seconds		

7. **(5 pts)** There are 900 sheep that live in a herd on a nearby farm. A study wants to pull a sample from the herd in order to find the proportion of lambs. What is the smallest possible sample size that can be used to stay within a margin of error no more than $\pm 6\,\%$ at a $90\,\%$ confidence level?

A	220	C	170	E	124
B	190	D	166		

8. **(5 pts)** What is the standard deviation of the data?

22, 17, 29, 12

A	5.5005	C	6.2849	E	52.6667
B	7.2572	D	20.0000		

9. **(15 pts)** The table shows the average annual income based on the number of years attending university. Find the line of best fit for the data.

Years at University	Average Annual Income
0	$34,700
1	$38,500
2	$41,200
4	$57,250
6	$68,950
8	$82,700
10	85,250

10. **(15 pts)** What are the measures of central tendency for the following temperatures, in Fahrenheit, for the month of February in Mexico? Round your answers to the nearest hundredth.

88, 77, 95, 79, 63, 70, 86, 94, 68, 76, 81, 91, 77, 80

88, 65, 95, 86, 74, 86, 93, 84, 70, 97, 60, 83, 88, 88

11. **(15 pts)** A local ice cream shop claims that $70\,\%$ of their $1{,}250$ customers order a cup of vanilla ice cream. You want to verify this claim, so you take a random sample of 100 customers to see whether or not they order a cup of vanilla. What's the probability that your results are within $5\,\%$ of the ice cream shop's $70\,\%$ claim?

12. **(15 pts)** You're planning a day to hike a nearby mountain, but the morning is cloudy. Out of all the rainy days that occur at the mountain, $66\,\%$ start off cloudy, but cloudy mornings are common ($50\,\%$ of days start off cloudy). This month is usually a dry month, and only $16\,\%$ of the days tend to be rainy. What's the chance that it will rain during your day at the mountain?