Probability & Statistics Final Exam

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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)** What effect does adding the outlier of 100 have on the mean of the data set?

$26, 28, 32, 40, 42, 44, 54$

A The mean increases by 7.75

B The mean decreases by 7.75

C The mean stays the same

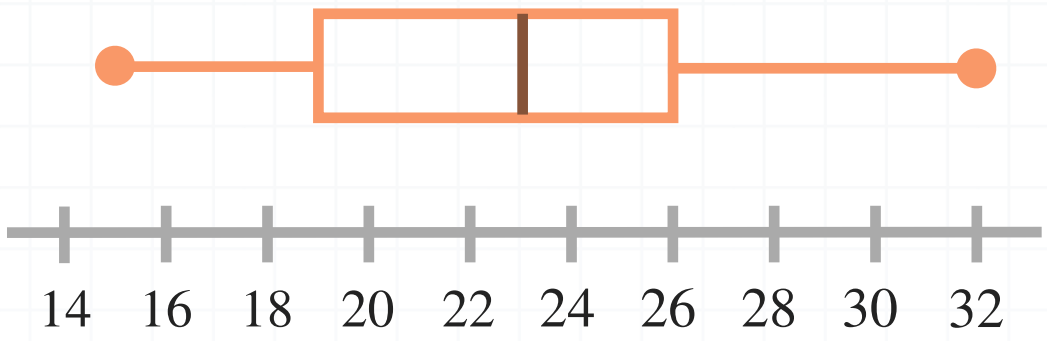
D The mean is multiplied by 7

E The mean is divided by 7

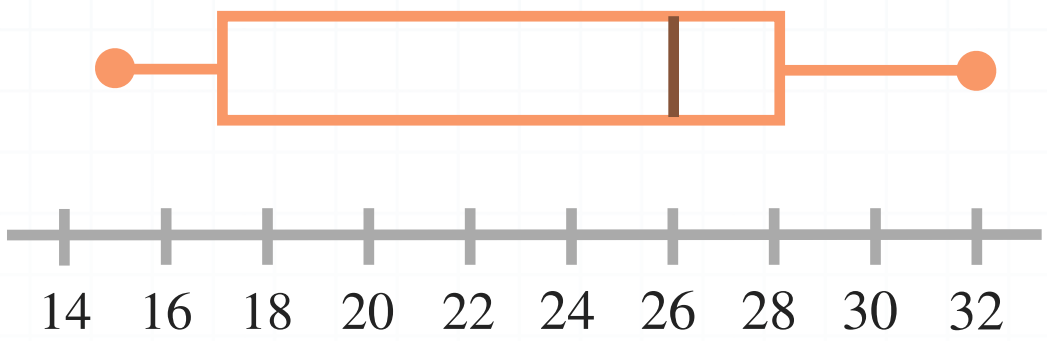
2. **(5 pts)** Which box-and-whisker plot correctly represents the data set?

17, 17, 32, 17, 26, 26, 15

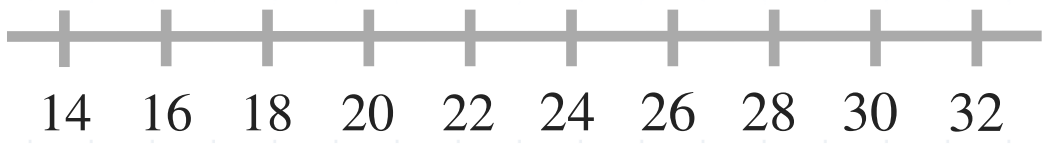
A



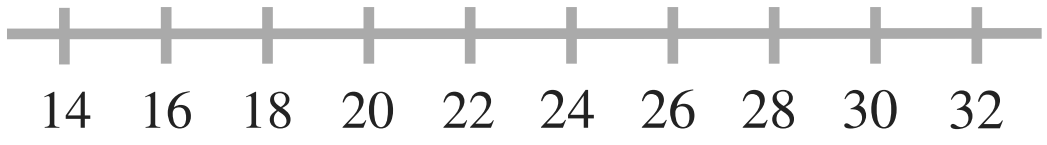
B



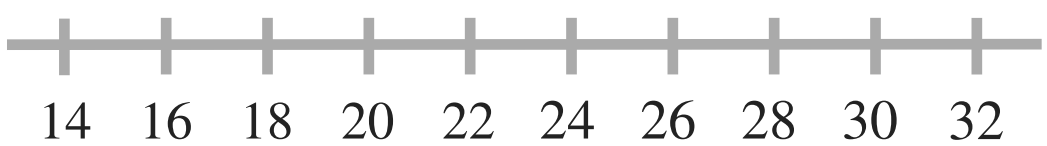
C



D



E



3. **(5 pts)** Every student at Jefferson High School needs to choose exactly one elective. The table shows the enrollment of electives for all students. What percentage of Architecture students are Seniors?

	Art	Architecture	Music	Total
Freshman	40	25	55	**120**
Sophomore	52	12	71	**135**
Junior	56	45	54	**155**
Senior	30	60	20	**110**
Total	**178**	**142**	**200**	**520**

A $75\,\%$

B $18\,\%$

C $8\,\%$

D $32\,\%$

E $42\,\%$

4. **(5 pts)** A card is drawn from a full deck of 52 cards. What is the probability that the card drawn will be either a face card or a black card?

A $\frac{3}{13}$

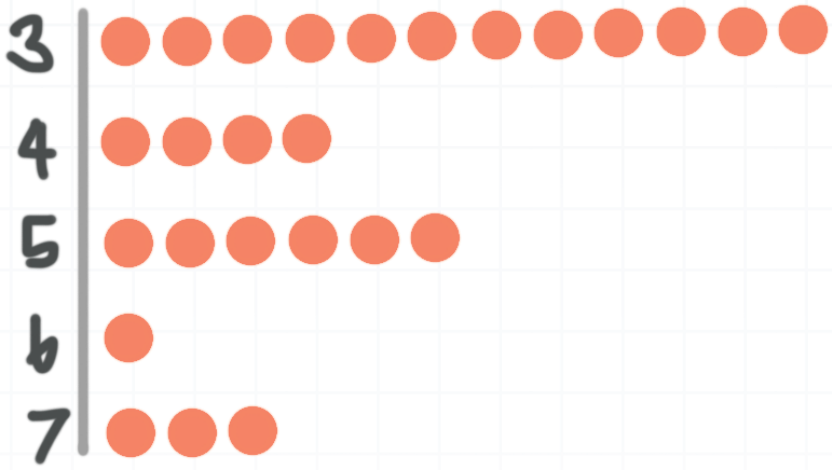
B $\frac{3}{26}$

C $\frac{13}{26}$

D $\frac{8}{13}$

E $\frac{29}{52}$

5. **(5 pts)** The dot plot shows the number of movies watched in the month by 26 high school students. What is the median number of movies watched in the month of June?



A	3	C	5	E	7
B	4	D	6		

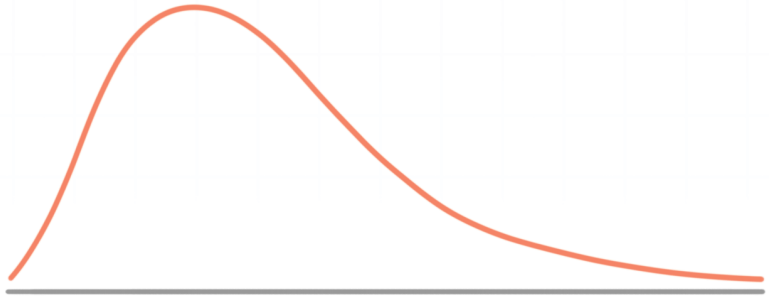
6. **(5 pts)** Suppose $32\,\%$ of our nation's 8th grade students will be taking an eye exam this year to determine if they need to wear corrective lenses. We select 90 students at random from our nation. What is the probability that exactly 40 will be taking the eye exam?

A	$40\,\%$	C	$0.41\,\%$	E	$99.6\,\%$
B	$32\,\%$	D	$5.7\,\%$		

7. **(5 pts)** There are 12 marbles in a bag: 4 blue, 5 red, 1 green, and 2 black. What is the probability of selecting one red marble?

A	8.3 %	C	33.3 %	E	58.3 %
B	1.7 %	D	41.7 %		

8. **(5 pts)** Which of the following statements are true about the given distribution?



I. The distribution has a mean that's greater than the median.

II. The distribution has a median greater than the mean.

III. A symmetric distribution is always normally distributed.

IV. The only reason for a distribution to have a tail is if it has an outlier.

A	I only	C	II only	E	II, III, and IV
B	I and II	D	I and IV		

9. **(15 pts)** Given the data set and its mean, find the value of x, the median, and the range of the data set.

$61,\ 78,\ 80,\ x,\ 91,\ 93$

$\mu = 82$

10. **(15 pts)** A history teacher gave a test to his students and calculated a median of 67, IQR of 8, and range of 44 for the class's scores. He decides to "curve" the scores by using the formula below. Find the median, IQR, and range for the new set of test scores.

$$\text{New score} = 1.05(\text{Old score}) + 5$$

11. **(15 pts)** Let X be a random variable with $\mu_X = 80$ and $\sigma_X = 4$. Let $Y = 5 + 3X$. Find μ_Y and σ_Y.

12. **(15 pts)** An artist is able to paint 14 canvases per month, on average. Find the probability that she can paint 17 canvases next month.