

Name \_\_\_\_\_

**AP Statistics**  
**Part 1 Review Test 3**

1.

Concert attendance for a stadium is normally distributed with a standard deviation of 7641. If a concert with 41,293 people in attendance is in the top 2% of all concert attendance records, what is the mean concert attendance?

- (A) 25,601
- (B) 27,917
- (C) 54,670
- (D) 56,986
- (E) 77,163

2.

The cause of death and the age of the deceased are recorded for 454 patients from a hospital.

	15–24	25–34	35–44	45–54	55–64	Total
Accident	14	12	15	12	7	60
Homicide	5	4	3	0	0	12
Heart disease	1	3	14	34	63	115
HIV	0	3	6	4	0	13
Cancer	2	4	17	47	89	159
Other	3	7	16	26	43	95
Total	25	33	71	123	202	454

Use these values to estimate the probability that a person at this hospital died as a result of an accident if it is known the person was between the ages of 45 and 54.

- (A) 0.0264
- (B) 0.0976
- (C) 0.1322
- (D) 0.2000
- (E) 0.4878

3.

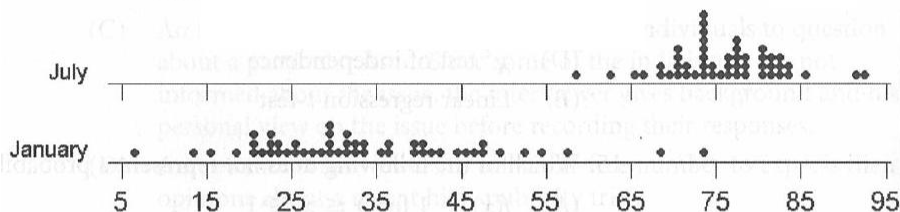
For a given school year, a reporter has been told that the average teacher's salary was \$59,500 with a standard deviation of \$17,200. The reporter also knows that teachers will be receiving raises of 3.25% for the next school year. What would the reporter write for the new average teacher's salary and standard deviation?

- (A) mean \$1934; standard deviation \$559
- (B) mean \$59,500; standard deviation \$17,200
- (C) mean \$59,500; standard deviation \$17,759
- (D) mean \$61,434; standard deviation \$17,200
- (E) mean \$61,434; standard deviation \$17,759

4.

The following dotplots show the mean temperature (in degrees Fahrenheit) for a sample of cities in North America. Both January and July temperatures are shown. What is one statement that can be made with certainty from an analysis of the dotplots?

Dotplot for January-July



- (A) Every city has a higher average temperature in July than in January.
- (B) The distribution of temperatures in July is skewed right, while the distribution of temperatures in January is skewed left.
- (C) There is more variability in average temperatures in January than in July.
- (D) The median average temperature for January is higher than the median average temperature for July.
- (E) There are no outliers in the average temperatures for January or July.

5.

The following table shows the preferred exercise for a random sample of 223 men of various ages.

Physical Activity/Age	18–31	32–45	46–59	60–73	Over 74
Jogging	23	14	9	1	0
Cycling	19	19	14	11	8
Swimming	10	8	5	3	1
Weight Lifting	34	21	12	6	5

If the type of exercise is independent of age, how many men over the age of 74 would we expect to prefer cycling?

- (A) 3
- (B) 4
- (C) 8
- (D) 11
- (E) 14

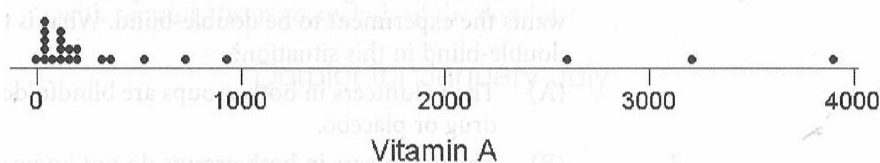
6.

The weights of women are approximately normally distributed. This week, the z-score of weight for a member of a weight-watching group is 1.25. Which of the following is a correct interpretation of this z-score?

- (A) This week the member weighs 1.25 lb more than last week.
- (B) This week the member weighs 1.25 lb less than last week.
- (C) This week the member weighs 1.25 lb more than the average woman.
- (D) This week the member weighs 1.25 standard deviations more than she did last week.
- (E) This week the member weighs 1.25 standard deviations more than the average woman.

7.

The following graph shows the vitamin A content (in IUs, International Units) for 23 types of fruit.



Which of the following is the best measure to describe the center of this distribution?

- (A) Mean
- (B) Median
- (C) Standard deviation
- (D) Interquartile range
- (E) Range

8.

Pearson High School students have cumulative grade point averages as shown in the table.

GPA \ Class	$\geq 4.0$	3.0–4.0	2.0–3.0	1.0–2.0	$< 1.0$	Total
Sophomores	43	121	114	22	10	310
Juniors	26	102	84	16	5	233
Seniors	15	87	100	10	7	219
Total	84	310	298	48	22	762

Which of the following statements is *not* true?

- (A) About 39% of sophomores have *at least* a 3.0 GPA.
- (B) Sophomores represent 39% of GPAs from 3.0 to 4.0.
- (C) Seniors represent about 29% of the reported GPAs at Pearson High School.
- (D) Only about 3% of seniors have GPAs *less than* 1.0.
- (E) About 11% of the reported GPAs are juniors with GPAs from 2.0 to 3.0.

9.

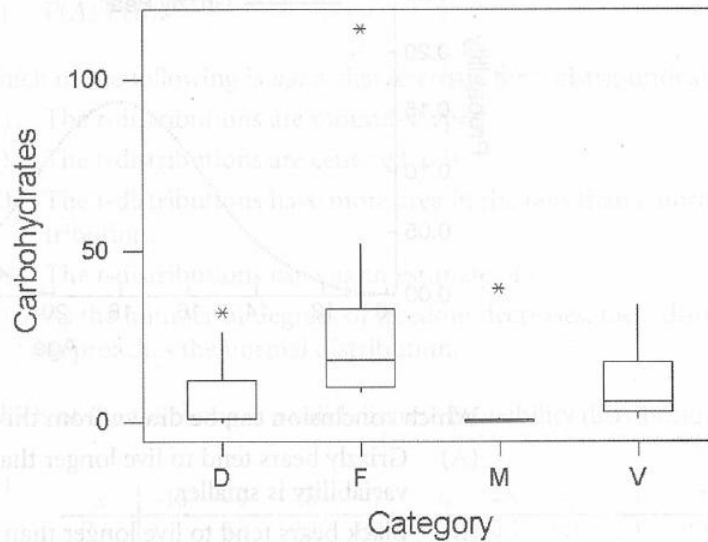
A high school administrator wishes to compare state assessment results of male and female students.

Which graphical display *wouldn't* you recommend to him?

- (A) Comparative dotplots
- (B) Back-to-back stemplot
- (C) Scatterplot
- (D) Parallel boxplots
- (E) Histograms drawn side by side with the same scale

10.

The carbohydrate content (in grams) for serving sizes of select dairy (D), fruit (F), meat (M), and vegetable (V) items is recorded, yielding the following graphical information.



Which of the four food categories would have the smallest value for *all* measures of spread?

- (A) Dairy
- (B) Fruit
- (C) Meats
- (D) Vegetables
- (E) Meats with the outlier removed

11.

A high school administrator wishes to compare state assessment results of male and female students.

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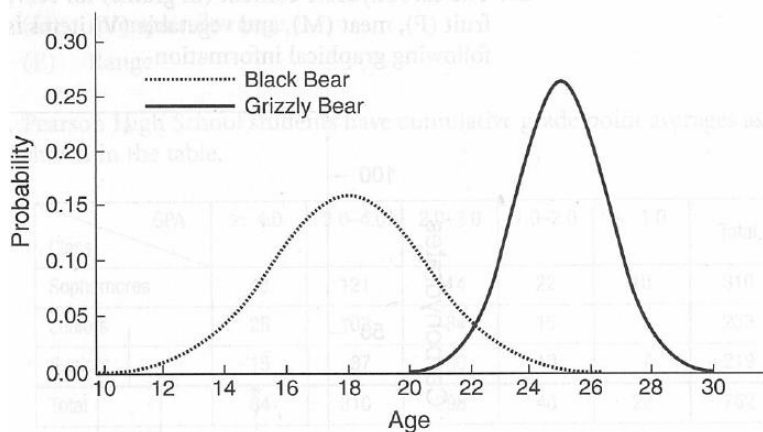
13.

Which of the following statements is true for the construction of a bar graph?

- (A) The scale of the horizontal axis should be the frequency.
- (B) There can be no gaps between bars.
- (C) Bar graphs are used to depict categorical data.
- (D) Mention of the shape, center, and spread should be made when describing bar graphs.
- (E) The width of the bars should differ according to the frequency of the class.

14.

Data are collected from zoos for the age at death (in years) for black bears and grizzly bears. The graphs below model the data collected from these zoos.

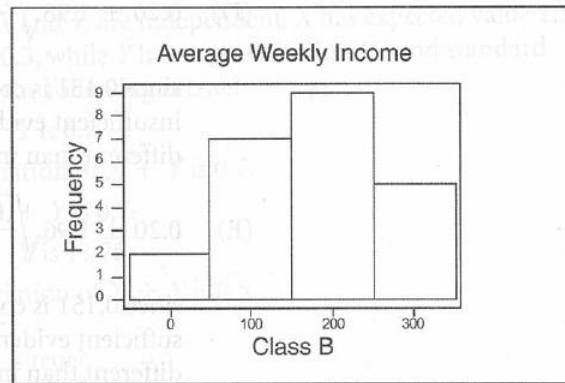
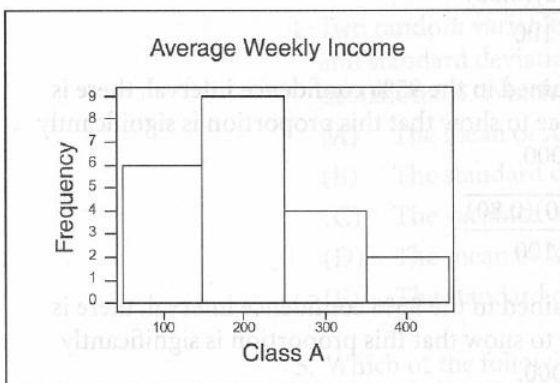


Which conclusion can be drawn from this graph?

- (A) Grizzly bears tend to live longer than black bears, but their variability is smaller.
- (B) Black bears tend to live longer than grizzly bears, but their variability is smaller.
- (C) Grizzly bears tend to live longer than black bears, and their variability is larger.
- (D) Black bears tend to live longer than grizzly bears, and their variability is larger.
- (E) Grizzly bears tend to live longer than black bears, and the two variabilities are approximately equal.

15.

The histograms below represent average weekly job income for students in two high school classes.

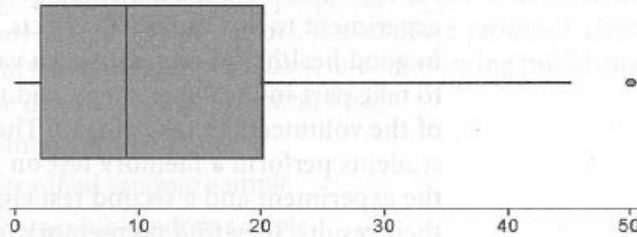


What conclusion is reasonable based on the displays? *Note:* Both classes have medians in the \$200 range.

- (A) The mean weekly income for class A is higher than for class B.
- (B) The mean weekly income for class B is higher than for class A.
- (C) More students in class B earn wages in excess of \$250 than in class A.
- (D) More students in class B have higher paying jobs than in class A.
- (E) All students in both classes have paying jobs.

16.

For the given boxplot, which are the correct summary statistics?



- (A) Variable Data Val N Mean Median TrMean StDev SE Mean  
47 12.23 9.00 11.16 12.16 1.77  
Variable Data Val Minimum Maximum Q1 Q3  
0.00 50.00 2.00 20.00
- (B) Variable Data Val N Mean Median TrMean StDev SE Mean  
47 12.23 9.00 11.16 12.16 1.77  
Variable Data Val Minimum Maximum Q1 Q3  
0.00 45.00 2.00 20.00
- (C) Variable Data Val N Mean Median TrMean StDev SE Mean  
47 9.00 9.00 11.16 12.16 1.77  
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0.00 50.00 2.00 20.00
- (D) Variable Data Val N Mean Median TrMean StDev SE Mean  
47 9.00 9.00 11.16 12.16 1.77  
Variable Data Val Minimum Maximum Q1 Q3  
0.00 45.00 2.00 20.00
- (E) Variable Data Val N Mean Median TrMean StDev SE Mean  
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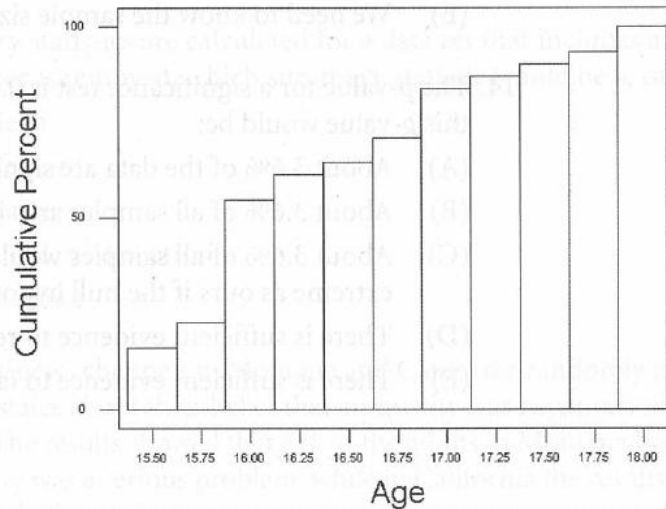
17.

Given that a population has a standard deviation of 0, which of the following statements *must* be true?

- I. The standard deviation of a sample drawn from the population is also 0.
  - II. The sample mean of a sample drawn from the population is also 0.
  - III. The sample mean and median are equal for a sample drawn from the population.
- (A) I only  
(B) III only  
(C) I and II only  
(D) I and III only  
(E) I, II, and III

18.

In a state where young adults can obtain learner's permits for driving 6 months before their 16th birthdays, a random sample of young adults applying for their permits is taken, and their ages in years are recorded. The cumulative proportions are plotted against age, resulting in the following graph.



The median and interquartile range for this group of individuals are

- (A) 16 and 1 year.
- (B) 16 and 1.5 years.
- (C) 16.75 and 1 year.
- (D) 16.75 and 1.5 years.
- (E) 50 and 50 years.

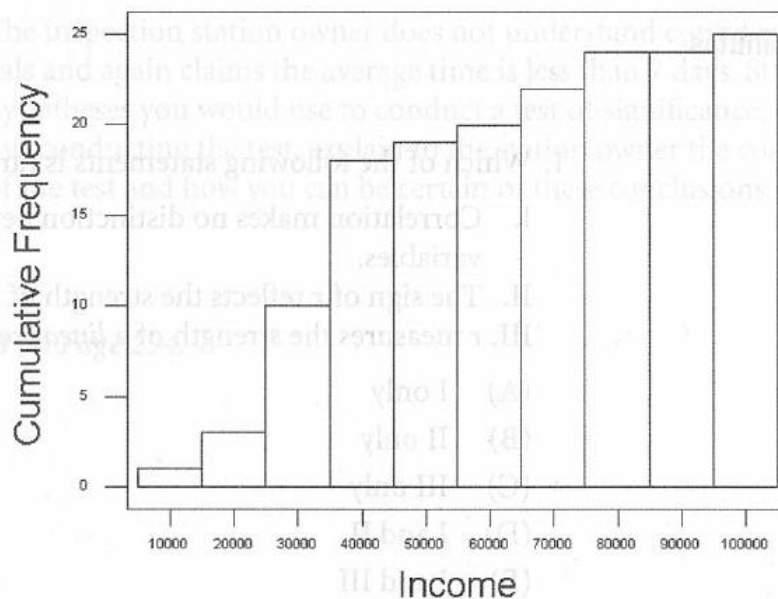
19.

Mr. DeVaux teaches two sections of AP\* Physics. He has 38 seniors in one section and 24 juniors in the other section. The overall mean for both sections on the midterm exam was 87. If the junior section had a mean of 92, what was the approximate mean for the senior section on the midterm exam?

- (A) 82.6
- (B) 83.8
- (C) 89.5
- (D) 87.0
- (E) 90.4

20.

Twenty-five men were polled, and their annual incomes were recorded. The cumulative frequency histogram below shows the results.



Which of the following statements can be made upon examination of the histogram?

- (A) The same number of men had incomes between \$75,000 and \$85,000 as between \$85,000 and \$95,000.
- (B) The median income was \$55,000.
- (C) The mean income was less than the median income.
- (D) The modal income was between \$35,000 and \$45,000.
- (E) No men had incomes between \$75,000 and \$85,000.



**Part II – Free Response**  
**Show your work.**

1.

Another researcher collected 20 random samples of size 10 and recorded the number of women who walk for physical activity.

Number of Walkers	Frequency
1	1
2	2
3	3
4	3
5	2
6	4
7	4
8	1

Create an appropriate graphical display of the researcher's data *and* the data from *your* simulation so that the two data sets can be compared.

2.

A triathlon is a sports competition with three distinct components. Some triathlons consist of a 2.4-mile swim, followed by a 112-mile bike ride, and end with a 26.2-mile run. The mean times (in minutes) and standard deviations for these portions of the race are recorded below.

Component	Mean	Standard Deviation
Swim	75.465	12.378
Bike	403.506	45.023
Run	287.497	49.894

- In a recent event, the fastest swimming time recorded was 49 minutes. If the swimming times are normally distributed, what is the probability that a randomly chosen triathlete will record a time of 49 minutes or less?
- At the same event, the slowest time for the bike portion of the race was 8 hours and 43 minutes. If the bike times are normally distributed, what is the probability that a randomly chosen triathlete will record a time of 8 hours and 43 minutes or more?

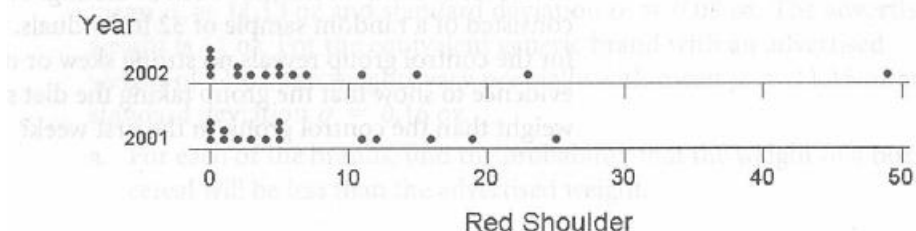
3.

In eastern Pennsylvania, the peak migration for red-shouldered hawks is October 15–31. During 2001 and 2002, the owner of a mountaintop home recorded the number of these hawks that migrated past her home each day during the peak migration season. The following summary statistics resulted:

Variable	Year	N	Mean	Median	TrMean	StDev
Red Shoulder	2001	16	6.81	4.50	6.00	7.62
	2002	16	8.25	4.50	5.93	12.53

Variable	Year	SE Mean	Minimum	Maximum	Q1	Q3
Red Shoulder	2001	1.90	0.00	25.00	1.00	11.75
	2002	3.13	0.00	49.00	0.50	10.00



- It appears that 49 is an outlier for 2002. Describe a procedure you would use to determine if this value is an outlier, and justify your answer based on that procedure.

- Compare the migration of red-shouldered hawks in 2001 and 2002.