

Statistics & Probability: EOC Prep

Spring 2013

Name: Key

Directions: The following questions are sample items similar to those found on the EOC Exam. Answer each to the best of your ability.



1. At a particular company, every employee receives a 4% cost-of-living increase to their salary.

What impact does this cost-of-living increase have on the mean and on the range of employee salaries at the company?

- A. The mean increases but the range does not change.
- B. The mean does not change but the range increases.
- C. The mean and range both increase.
- D. The mean and range do not change.

2. The frequency table below shows the age distribution of people at a park.

| | 0-19 years | 20-39 years | 40-59 years | 60-70 years | 80-99 years |
|--------|------------|-------------|-------------|-------------|-------------|
| Male | 50 | 18 | 12 | 4 | 2 |
| Female | 42 | 18 | 14 | 6 | 1 |

What is the probability a randomly selected person at the park is a female, given that the person is under 40 years old?

A $\frac{60}{167}$

B $\frac{15}{32}$

C $\frac{1}{2}$

D $\frac{60}{81}$

$Under\ 40 = 50 + 42 + 18 + 18 = 128\ total$

$Female = 42 + 18 = 60$

$\frac{Female}{Total} = \frac{60}{128} = \frac{15}{32}$

3. Twenty-one students at a school have an allergy to peanuts, shellfish, or both.

- Fourteen students at the school are allergic to peanuts.
- Twelve students at the school are allergic to shellfish.

How many of the students are allergic to both peanuts and shellfish?

A 12

B 7

C 5

D 2

14
 $+12$

26
 -21
 5

$26\ w/allergies, but\ only\ 21\ total$

$$\frac{\text{girl No Track}}{\text{Total seniors}} = \frac{128}{250}$$

4. There are 250 students in a senior class.

- Of the 250 students, 102 are boys.
- There are 20 senior girls and 18 senior boys on the track team.

What is the probability a randomly chosen student from the senior class is a girl who does not run track?

| | | <u>Track</u> | <u>No-track</u> | <u>Total</u> |
|----------|-------|-----------------|-----------------|--------------|
| A | 0.920 | | | |
| B | 0.512 | <u>Girls</u> 20 | 128 | 148 |
| C | 0.497 | <u>Boys</u> 18 | 84 | 102 |
| D | 0.135 | <u>Total</u> 38 | 212 | 250 |

5. An elevator can hold a maximum of 1,500 pounds. Eight people need to use the elevator. Bill had some measures from the data set of how much each person weighed. Which measure would be most useful to determine if the people can safely use the elevator?

- A** mean
- B median
- C mode
- D interquartile range

6. The table below shows the area of several states.

| State | Area (thousands of square miles) |
|----------------|----------------------------------|
| Connecticut | 6 |
| Georgia | 59 |
| Maryland | 12 |
| Massachusetts | 11 |
| New Hampshire | 9 |
| New York | 54 |
| North Carolina | 54 |
| Pennsylvania | 46 |

■ = original values
 ■ = values w/ Delaware added

Delaware

2

Delaware has an area of 2,000 square miles. Which is true if Delaware is included in the data set?

- A The mean increases. \bar{x} 31.4 28.11
- B The range decreases. High-low 53 57
- C The interquartile range decreases. $Q_3 - Q_1$ 44 46.5
- D** The standard deviation increases. σ 22.1 22.9

7. The number of points scored by a basketball player in the first eight games of a season are shown below.

15, 35, 18, 30, 25, 21, 32, 16

What would happen to the data distribution if she scored 24, 22, 27, and 28 points in her next four games?

- A The data distribution would become less peaked and more widely spread.
 B The data distribution would become less peaked and less widely spread.
 C The data distribution would become more peaked and less widely spread.
 D The data distribution would become more peaked and more widely spread.
8. A book club has 200 members. Each member was asked whether he or she prefers fiction or nonfiction books. The results are shown in the relative frequency table below.

Multiply each decimal by 200

| Age | Fiction | Nonfiction | Total |
|-------|-----------------|----------------|-----------------|
| 21-30 | 0.32 <i>64</i> | 0.11 <i>22</i> | 0.43 <i>86</i> |
| 31-40 | 0.38 <i>76</i> | 0.19 <i>38</i> | 0.57 <i>114</i> |
| Total | 0.70 <i>140</i> | 0.30 <i>60</i> | 1.00 <i>200</i> |

Which statement is true?

- ~~A~~ 6 more 31-40-year-olds than 21-30-year-olds prefer fiction. *76 - 64 = 12*
~~B~~ 38 members are 31-40 and prefer fiction. *76*
~~C~~ 43 members are 21-30 years old. *86*
 D 140 members prefer fiction. *140 ✓*
9. A college surveyed 3,500 of its students to determine if the students preferred music, movies, or sports. The results of the survey are shown in the relative frequency table below.

Multiply each decimal by 3500

| | Music | Movies | Sports |
|------------|-------|--------|--------|
| Freshmen | 0.06 | 0.10 | 0.09 |
| Sophomores | 0.09 | 0.05 | 0.10 |
| Juniors | 0.10 | 0.06 | 0.08 |
| Seniors | 0.08 | 0.09 | 0.10 |

945
~~*840*~~
105

How many more seniors than juniors were included in the survey?

- A 70
 B 105
 C 140
 D 175

total

Seniors: 0.08 × 3500 = 280
0.09 × 3500 = 315
0.10 × 3500 = 350

945

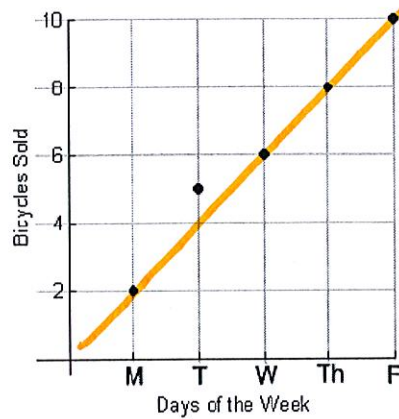
juniors: 0.1 × 3500 = 350
0.06 × 3500 = 210
0.08 × 3500 = 280

840



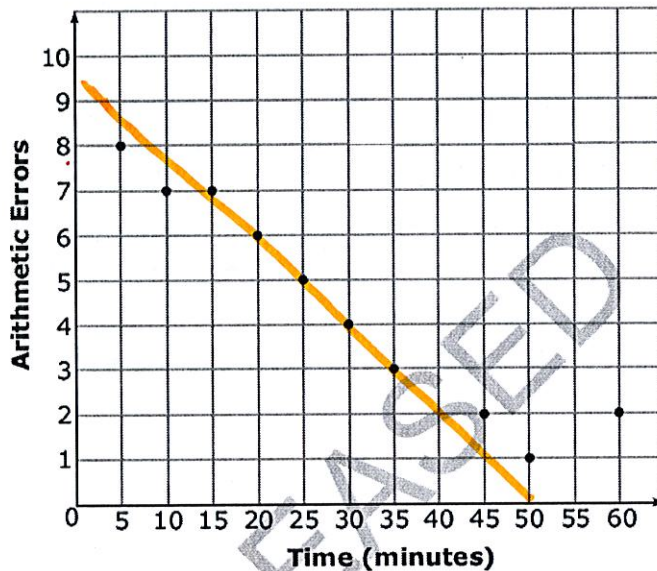
10. In the scatter plot shown at the right, which statement best describes the correlation between the days of the week and the number of bicycles sold?

- [1] high negative correlation
- [2] low negative correlation
- [3] high positive correlation
- [4] low positive correlation



Strong/high because many values fall on the line of best fit.

11. The scatterplot below shows the number of arithmetic errors 10 students made on a quiz and the amount of time the students took to complete the quiz.



Strong b/c many values fall on the line of best fit

Which describes the relationship between the number of arithmetic errors the students made and the amount of time the students took to complete the quiz?

- A There is a strong positive relationship between the variables.
- B There is a strong negative relationship between the variables.
- C There is a weak positive relationship between the variables.
- D There is a weak negative relationship between the variables.