

Math 10 Fall 2015 **FORM A** Name Last: _____ First: _____

Exam 2: Chapters 4,5,6,7

Class Time: _____

INSTRUCTIONS:

- Print your NAME and CLASS TIME on THIS EXAM
 - Print your NAME and CLASS TIME on your SCANTRON.
 - Write FORM A on your SCANTRON.
 - Turn your cell phone OFF. Any noise from a cell phone will signal that your exam is over.
 - Each question has exactly one BEST answer. There are 21 questions.
 - You may write on this exam. There is no scratch paper allowed.
 - Each question is worth 5 points for a total of 105 points.
 - If you have no note page, you must write **NO NOTES** on your SCANTRON.
 - Put your SCANTRON and PAGE of NOTES inside your EXAM. Before you start packing up your things, turn in your EXAM and SCANTRON. Then go back to your desk to pack up your materials. When your exam is returned, you will get back all your materials.
 - **FAILURE TO FOLLOW ALL INSTRUCTIONS WILL COST YOU 5 POINTS!**
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Questions 1 - 3 refer to the following:

At a community college, 46% of students are registered to vote.

Suppose that a random sample of 25 students at the college are selected.

1. Find the probability that **more than 10** students in the sample are registered to vote.

- A. 0.7980 B. 0.3462 C. 0.6538 D. 0.8657

2. Find the probability that **exactly 8** students are registered to vote

- A. 0.0612 B. 0.9388 C. 0.1135 D. 0.32

3. If we looked at many randomly selected samples of 25 students at that community college, how many students per sample would we expect to be registered to vote, on average.

- A. 12 B. 11.5 C. 6.21 D. 2.49

4. Sweetz Bakery has sourdough bread on sale this week. Here is the probability distribution for the number of sourdough breads a customer purchases. There is a limit of at most 5 loaves of bread per customer at this special price.

Number of Loaves of Bread purchased	0	1	2	3	4	5
Probability	0.20	0.55		0.10	0.05	0.02

What percent of customers purchase two or three loaves of bread?

- A. 18% B. 8% C. 10% D. 1.31

Questions 5 – 8 refer to the following:

The time between calls (after one call until the next call) for police emergency services often follows an exponential distribution. Suppose that in the city of Harpville, the time, in minutes, between calls to a police emergency services number follows an exponential distribution with a decay parameter of 0.125.

5. What is the average time between calls?
- A. 12.5 minutes B. 0.125 minutes C. 8 minutes D. 3.6 minutes
6. Find the probability that the time until the next call is **more than 10** minutes.
- A. 0.4013 B. 0.20 C. 0.7135 D. 0.2865
7. For a random sample of 64 calls, what is the distribution for the sample average time between calls?
- A. $\text{Exp}(0.125)$ B. 0.20 C. $N(8, 1)$ D. $N(8, 8)$
8. For a random sample of 64 calls, find the probability that the sample average time between calls is between 8 and 10 minutes.
- A. 0.4772 B. 0.0987 C. 0.0814 D. 0.3579

Questions 9 – 11 refer to the following:

Suppose that the lengths of steel rods used on a construction project follow a uniform distribution between 2.5 and 3.3 meters.

9. Find the probability that a randomly selected rod is **at least 3** meters in length.
- A. 0.675 B. 0.375 C. 0.3554 D. 0.0909
10. Find the 80th percentile of lengths for these steel rods.
- A. 3.21 m. B. 2.64 m. C. 3.07 m. D. 3.14 m.
11. For a random sample of 100 of these steel rods, what is the distribution for the sample average length?
- A. $U(2.5, 3.3)$ B. $U(2.9, 0.23)$ C. $N(2.9, 0.23)$ D. $N(2.9, 0.023)$

12. Which of the following is NOT true?

- A. The exponential distribution is skewed to the left.
- B. If $f(x) = 0.25$ for a continuous distribution, the distribution is uniformly distributed.
- C. For a continuous probability distribution, the entire area under the probability density curve is **always** equal to 1.
- D. All of the above

Questions 13 – 16 refer to the following:

The length of fish fossils in a dry river bed is normally distributed with a mean of 4 cm and a standard deviation of 0.5 cm.

13. The middle 40% of fossil lengths are between _____ and _____ cm.

- A. from 3.9 to 4.1 cm
- B. from 3.738 to 4.262 cm
- C. from 3.873 cm to 4.127 cm
- D. from 3.8 to 4.2 cm

14. The probability that a fossil is **exactly 3 cm** is

- A. 0.75
- B. 0.50
- C. 0.4772
- D. 0

15. The probability that a fossil is **longer than 4.8 cm** is

- A. 0.4452
- B. 0.167
- C. 0.9452
- D. 0.0548

16. Which of the following is larger?

- I. The probability that a fossil is between 3.5 and 4.5 cm.
- II. The probability that the average length for a sample of $n=9$ fossils is between 3.5 and 4.5 cm.

- A. I is larger
- B. II is larger
- C. I and II are equal
- D. Not enough information given to determine

Questions 17 – 19 refer to the following:

A study was conducted to investigate the ages of college students. X = the age of a college student

17. Suppose X follows a distribution skewed to the right.
What is true about the shape of the distribution of \bar{X} , the **average age** for a sample of 100 college students?
- A. Skewed to the right
 - B. Skewed to the left
 - C. Symmetric
 - D. Same as the distribution of ages of individual college students.
18. As the sample size increases, how does that affect the mean for the distribution of \bar{X} ?
- A. $\mu_{\bar{X}}$ stays the same
 - B. $\mu_{\bar{X}}$ increases
 - C. $\mu_{\bar{X}}$ decreases
 - D. $\mu_{\bar{X}}$ changes but we can't tell how unless we have more information about the particular situation.
19. Which of the following has the smallest standard deviation?
- I. The distribution for X = the age of a college student
 - II. The distribution for \bar{X} = the average age for a sample of 100 college students
 - III. The distribution for \bar{X} = the average age for a sample of 400 college students
- A. I
 - B. II
 - C. III
 - D. II and III both the are the same and are smallest
20. Which of the following must be true for the Binomial distribution to apply?
- I. We are counting the number of successes in a fixed number of trials.
 - II. The probability of success on each trial depends on whether the previous trials were a success or a failure.
 - III. The probability of success decreases with each additional trial.
- A. I only
 - B. I and II only
 - C. I and III only
 - D. I, II, and III
21. Suppose you play a game in which you roll 1 die once. If the number rolled is less than 3, you win \$4. If the number rolled is at least 3, then you lose \$2.50.
Find the expected amount won or lost if you play this game 50 times.
- A. \$0.33 loss
 - B. \$16.67 loss
 - C. \$75 gain
 - D. \$12.50 loss

Math 10 Fall 2015 **FORM B** Name Last: _____ First: _____

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Questions 1–4 refer to the following:

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1. The probability that a fossil is **exactly 3 cm** is
A. 0.75 B. 0.50 C. 0.4772 D. 0
2. The probability that a fossil is **longer than 4.8 cm** is
A. 0.4452 B. 0.167 C. 0.9452 D. 0.0548
3. The middle 40% of fossil lengths are between _____ and _____ cm.
A. from 3.9 to 4.1 cm
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II. The probability that the average length for a sample of $n=9$ fossils is between 3.5 and 4.5 cm.
A. I is larger B. II is larger C. I and II are equal
D. Not enough information given to determine

5. Sweetz Bakery has sourdough bread on sale this week. Here is the probability distribution for the number of sourdough breads a customer purchases. There is a limit of at most 5 loaves of bread per customer at this special price.

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11. Which of the following is NOT true?
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	Form A	Form B
1	C	D
2	A	D
3	B	B
4	A	B
5	C	A
6	D	B
7	C	A
8	A	C
9	B	C
10	D	A
11	D	A
12	A	C
13	B	D
14	D	C
15	D	A
16	B	B
17	C	D
18	A	D
19	C	B
20	A	C
21	B	A