

## Homework assignment # 2

Remember to put both your names on the homework if you're working with someone else.

2nd edition references are given in normal type.

**[3rd edition references are given in bold and in square brackets].**

*{4th edition references are given in italics, underlined and in curly brackets}.*

*Please watch for changes to the problems!*

1) Problem 2.25, p. 47 [**2.32, p. 39**] *{2.4.3, p. 51}*. But assume 14 ewes; the three additional ewes had a milk yield of 33.2, 90.3 and 128.5 liters.

2) Problem 2.26, p. 47 [**2.33, p. 39**] *{4th edition, see comment}*. Please be careful here; make sure you actually construct a correct parallel boxplot. But assume 14 women and add a woman who exercised 0.5 hours.

*{4th edition comment:}* This problem is not in the 4th edition, so here it is:

A group of college students were asked how many hours per week they exercise. The answers given by 12 men were as follows:

6 0 2 1 2 4.5 8 3 17 4.5 4 5

The answers given by 13\* women were as follows:

5 13 3 2 6 14 3 1 1.5 1.5 3 8 4

(\*don't forget to add a woman with 0.5 hours (see comment above))

Construct parallel (side by side) boxplots (modified) of the male and female distributions.

3) Problem 3.1, p. 86 [**3.1, p. 77**] *{1.3.5, p. 24}*.

*Also, do the following:*

(c) Carefully count the exact number of mutants.

(d) Which do you think is the most accurate method of figuring out the number of mutants? Why?

4) Problem 3.6, p. 94 [3.18, p. 101] {3.5.1, p. 107}. If you want to look at an example, see problem 3.5, p. 93 [3.5, p. 83] {example 3.5.5, p. 104 (the 4th edition uses this problem as an example)}, which has the answers in the back of the book.

*For a brood size of 6, change the frequency to 1000 (not 750). You now have a total of 5250, not 5000. Now do:*

a)  $\Pr\{Y = 5\}$    b)  $\Pr\{Y \geq 5\}$    c)  $\Pr\{3 \leq Y \leq 5\}$

5) Problem 3.9, p. 99 [3.8, p. 87] {3.2.4, p. 93}. But suppose our student learned 75% of the material (NOT 40%). **Hint:** if she knows an answer, what is the probability she will get this answer wrong? (Lots of people have problems with this one).

6) Problem 3.11, p. 99 [3.10, p. 88] {3.2.6, p. 94}. You shouldn't have to do 3.10 [3.9], but it might help you if you're confused (the answers to 3.10 (a) [3.9 (a)] are in the back of the book). Change the problem to assume it's 1250 women (not 1,000) who take the early pregnancy test.

7) Problem (not in 2nd edition, see below) [3.11, p. 88] {3.2.7, p. 94} :

Suppose that a medical test has a 92% chance of detecting a disease if the person has it, and a 94% chance of correctly indicating that the disease is absent if the person really does not have the disease. Suppose 10% of the population has the disease:

(a) What is the probability that a randomly chosen person will test positive?

(b) Suppose a randomly chosen person does test positive. What is the probability that this person really has the disease?

***BIOL 214: Problems are due in recitation June 12<sup>th</sup>.***

***BIOL 312: Problems are due at the beginning of lab, June 13<sup>th</sup>.***

**Copying answers from other students or from previous classes is a violation of the honor code!**