Chapter 5 FRAPPY! Sample 1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

A statistics teacher has 40 students in his class, 23 females and 17 males. At the beginning of class on a Monday, the teacher planned to spend time reviewing an assignment due that day. Unknown to the teacher, only 19 of the females and 11 of the males had completed the assignment. The teacher plans to randomly select students to do problems from the assignment on the whiteboard.

(a) What is the probability that a randomly selected student has completed the assignment?

	F	M	
Complete	19	11	30
Not	4	6	10
	23	17	40

$P(\text{complete}) = \frac{30}{40} = .75$

(b) Are the events "selecting a female" and "selecting a student who completed the assignment" independent? Justify your answer.

$P(\text{Female}) = \frac{23}{40} = .575$

$P(\text{Female} \mid \text{complete}) = \frac{19}{30} = .633$

Because $P(F) \neq P(F/c)$, these events are not independent.

Suppose that the teacher randomly selects 4 students to do a problem on the whiteboard and only 2 of the students had completed the assignment.

(c) Describe how to use a table of random digits to estimate the probability that 2 or fewer of the 4 randomly selected students completed the assignment.

Using 2 digit numbers, 00 – 74 will be students who completed the assignment and 75–99 will be students who didn't. Read L->R on the table looking at the first 4 two-digit numbers (skipping repeats), count how many #'s are 00–74 (Completed) in these 4 numbers and record whether or not there were two or less, and so on with the next set of 4 #'s, etc.

(d) Complete three repetitions of your simulation using the random digits below and use the results to estimate the probability described in part (c).

3/4 3/4 4/4

12975 13258 13048 45144 72321 81940 00360 02428

C N C C | N C C C | C C C C | C C C C

96767 35964 23822 96012 94951 65194 50842 55372

37609 59057 66967 83401 60705 02384 90597 93600

In my three trials, never did a sample of 4 students have 2 or fewer complete the assignment, so the probability is 0.

Chapter 5 FRAPPY! Sample 2

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

A statistics teacher has 40 students in his class, 23 females and 17 males. At the beginning of class on a Monday, the teacher planned to spend time reviewing an assignment due that day. Unknown to the teacher, only 19 of the females and 11 of the males had completed the assignment. The teacher plans to randomly select students to do problems from the assignment on the whiteboard.

(a) What is the probability that a randomly selected student has completed the assignment?

P(complete) = .75

(b) Are the events "selecting a female" and "selecting a student who completed the assignment" independent? Justify your answer.

NO. P(complete) = .75 but P(female) = .575

Suppose that the teacher randomly selects 4 students to do a problem on the whiteboard and only 2 of the students had completed the assignment.

(c) Describe how to use a table of random digits to estimate the probability that 2 or fewer of the 4 randomly selected students completed the assignment.

Number the kids 01-30 as completed the assignment and 31-40 as incomplete. Then using a random digits table, make 4 sets of 4 using #'s in between 01-40, ignoring higher or lower #'s. Repeat many times.

(d) Complete three repetitions of your simulation using the random digits below and use the results to estimate the probability described in part (c).

12975 13258 13048 45144 72321 81940 00360 02428

96767 35964 23822 96012 94951 65194 50842 55372

37609 59057 66967 83401 60705 02384 90597 93600

In only 1 of my 3 trials did I find two or fewer students that did their assignment. Therefore, the probability is approx 1/3.