

Name: _____

February 11

QUIZ 3

Ground rules:

- DO NOT WRITE YOUR NAME ON THE QUIZ. If you're worried about losing the first page, write your student number on each page.
- You can use your notes or books, but you may not communicate with other people about this exam nor the material covered by it.
- In order to receive as much credit as possible, please show all of your work. Showing that you understand the question and know how to set up the solution correctly is more important than arriving at the exact answer.
- Read each question carefully and answer all parts of each question.
- Good luck!

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1. Here is a probability distribution of number of children age 14 or younger living in a household in Washington State. Use this table to answer questions 1a and 1b below.

Number Children age 14 or younger X	P(X)
0	.693
1	.141
2	.118
3	.034
4	.011
5	.002
6	.001

1a. What is the probability that a household will have 4 or more children under the age of 14 living in it? Make sure to state your answers in terms of probability and to interpret your answer. (5 points)

1b. From this distribution, calculate the average number of children under 14 in Washington Households and the standard deviation. Show your work and make sure to interpret your results. (10 points)

2. Recent news stories have talked about the problem of methylmercury (a form of mercury) found in most freshwater and saltwater fish. Swordfish have among the highest levels of mercury. The average mercury content in swordfish is 1.00 ppm (parts per million), with a standard deviation of 0.77 ppm.¹ Assume the mercury content in swordfish is normally distributed.

2a. In Canada, fish with mercury content of .5 ppm or more are considered unsafe. What proportion of swordfish contain unsafe levels of mercury according to officials in Canada? Make sure you show how you arrived at your answer. Interpret your results. (10 points)

2b. In the U.S., the level of mercury contamination that is considered unsafe is 1.0 ppm. What proportion of swordfish are unsafe according to U.S. officials? Make sure you show how you arrived at your answer. Interpret your results. (5 points)

¹ Source: U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Seafood. May 2001. Mercury Levels in Seafood Species. Available at: <http://www.cfsan.fda.gov/~frf/sea-mehg.html>.

2c. In Canada, though, swordfish is exempt from the 0.5 guideline because it is known to generally have levels of mercury that fall between 0.5 and 1.5 ppm, allowing for occasional consumption (say 1 meal per week). What proportion of swordfish are within this minimally acceptable level of mercury? Interpret your results. (5 points)

3. Recap last quiz: Investing is a game of chance. Suppose there is a 40% chance that a risky stock investment will end up in a total loss of your investment. Because the rewards are so high, you decide to invest in four independent risky stocks. What is the probability that all four stocks end up in total losses? Make sure you state the probability rule you employ. State your work in terms of probability and in English. (5 points)