Q4 Lead https://thinkingquantitatively.wordpress.com/

Please type answers if possible and print this document with extra space so you do not have to mush all your work together. Change font for your answers so they stand out. Thanks!

1. In the article, *What the Science Says About Long Term Damage from Lead*[1], they mention 5 micrograms (mcg) per deciliter (dL) as being an alarming level of lead in the blood.
    a. Using 1,000,000 mcg per g and 1 cup : 0.24 L and 10 dL per L, convert 5 mcg/dL to grams per cup.

    b. They say the percentage of children under age 5 in Flint with lead levels that high has doubled from 2.4% to 4.9%. Compute the total change and percentage change from 2.4% to 4.9%.

    c. Jessica Wolpaw Reyes links elevated lead levels with low achievement test scores in 3rd and 4th grade. Assume there is a 5 percent increase in the proportion of children with lead levels above 10 mcg/dL, what is the corresponding increase in the proportion achieving unsatisfactory test scores?

    d. Why would it be unethical to explore the link between lead levels and low scores in a randomized controlled trial?

2. If we set the cutoff for dangerous lead levels at 10 mcg/dL, then the children in Rhode Island with levels between 5 to 9 mcg/dL would be considered safe even though 38% of them tested below the benchmark for reading readiness in kindergarten. Would these children (5 to 9 mcg/dL) be considered false positives or false negatives relative to safe lead exposure?

3. Joel Best talks about the "dark figure" associated to every social problem. Which social problem, lead exposure or teen pregnancy, do you think has a larger dark figure? Explain!

4. Joel Best talks about broad and narrow definitions. Imagine that you are part of a committee mandated to write the definition of plagiarism to be enforced at Bowdoin by the Judicial Board.
    a. Give a broad definition of plagiarism.
    b. Give a narrow definition of plagiarism.
    c. Which of your definitions will create more false negatives? Explain!
    d. Which of your definitions would you want adopted? Explain!

---

[1] http://www.nytimes.com/2016/02/09/upshot/what-the-science-says-about-long-term-damage-from-lead.html