

Chapter 8 FRAPPY!

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.

Members at a popular fitness club currently pay a \$40 per month membership fee. The owner of the club wants to raise the fee to \$50 but is concerned that some members will leave the gym if the fee increases. To investigate, the owner plans to survey a random sample of the club members and construct a 95% confidence interval for the proportion of all members who would quit if the fee was raised to \$50.

(a) Explain the meaning of “95% confidence” in the context of the study.

(b) After the owner conducted the survey, he calculated the confidence interval to be 0.18 ± 0.075 . Interpret this interval in the context of the study.

(c) According to the club’s accountant, the fee increase will be worthwhile if fewer than 20% of the members quit. According to the interval from part (b), can the owner be confident that the fee increase will be worthwhile? Explain.

(d) One of the conditions for calculating the confidence interval in part (b) is that $n\hat{p} \geq 10$ and $n(1 - \hat{p}) \geq 10$. Explain why it is necessary to check this condition.