

Level E

Cheryl's mother baked a large rectangular pan of brownies for Cheryl and her two friends, Joanne and Richard, to share after school. Cheryl and Joanne got to the house at the same time. They knew Richard was coming over later.



They cut the brownie into three equal size pieces. Cheryl took one of the pieces and Joanne took another, leaving the third piece for Richard. Cheryl and Joanne each began to eat their share of brownies. When they were finished, Richard had still not shown up.

They were both still hungry so they decided to take Richard's piece and divide it into thirds again. Cheryl and Joanne began to eat their new "one-third" slices, leaving Richard with only one-third of his original piece.

Still Richard did not show, so the two friends decided to cut his remaining piece in thirds again. They set aside one of the cut pieces for Richard, and ate the other two.

If Richard never comes over to the house and the two friends continue their process of eating and dividing the remaining slices, how much will they each eat?

- Represent your answer in an equation.
- What can you conclude from an infinite sum?
- Suppose there were four friends and only three showed up to eat the brownies originally cut into fourths. If a similar process occurred how much would each of the three friends eat? Represent your conclusion in an equation with an infinite sum.
- Generalize your finding about similar sets of infinite sums.