Problem 1. The figure below shows the first five steps in the creation of Sierpiński’s Carpet, which is formed by starting with a black square carpet of side length 10 feet (leftmost picture), dividing it up into 9 equal subsquares, and then removing the middle subsquare (second picture from the left). This process is then repeated forever, where the remaining 8 subsquares created in the previous step are further divided up into 9 equal subsquares, and then the central square is removed: middle picture, then the second from the right, then the rightmost, and so on. In other words, Sierpiński’s Carpet is the result of this process continuing on forever. What is the area of the black region of Sierpiński’s Carpet? Justify your answer.