Bicycle and Fly Problem

Two cyclists 20 miles apart began riding directly toward each other. The instance they started, a fly on the handlebar of one bicycle started flying straight toward the other cyclist. As soon as it reached the other handlebar it turned and started back. The fly went back and forth this way, from handlebar to handlebar, until the two cyclists met.

If each cyclist had a constant speed of 10 miles per hour, and the fly flew at a constant speed of 15 miles per hour, how far did the fly travel?

1   Hint 1

Consider an infinite series.

2   Hint 2

There's an easier way than summing

$$12 + \frac{12}{5} + \frac{12}{25} + \frac{12}{125} + ...$$

3   Hint 3

Consider how long it takes the cyclists to meet. How far can the fly travel in that time?