Exercise 56

An American tourist visits Paris and must convert U.S. dollars to Euros, which can be done using the function $E(x) = 0.79x$, where x is the number of U.S. dollars and $E(x)$ is the equivalent number of Euros. Since conversion rates fluctuate, when the tourist returns to the United States 2 weeks later, the conversion from Euros to U.S. dollars is $D(x) = 1.245x$, where x is the number of Euros and $D(x)$ is the equivalent number of U.S. dollars.

   a. Find the composite function that converts directly from U.S. dollars to U.S. dollars via Euros. Did this tourist lose value in the conversion process?

   b. Use (a) to determine how many U.S. dollars the tourist would get back at the end of her trip if she converted an extra \$200 when she arrived in Paris.

Solution

Part (a)

Plug in the formula for Euros to the formula for dollars.

$$D(E(x)) = 1.245E(x) = 1.245(0.79x) = 0.98355x$$

The tourist loses value in the conversion process, getting about \$98.36 after the trip for every \$100 dollars converted to Euros before the trip.

Part (b)

Converting an extra \$200 to Euros will result in

$$D(E(200)) = 0.98355(200) = \$196.71$$

after two weeks when she converts back to dollars.