Activity 2 - International Business Deal

You are the owner of a medium-sized manufacturing company based in the United States. You've been working on expanding your business to cater to international clients. An opportunity arises to work with a client in Brazil who wants to purchase a large shipment of your products.

Negotiation and Agreement: After negotiations, you and the Brazilian client agree on a deal worth **1.2 million Brazilian reais (BRL)**. The Brazilian client prefers to pay in their local currency, BRL. However, your company operates primarily in US dollars (USD), so you need to convert the payment to your home currency.

1. If the current exchange rate is **1 USD = 5 BRL**, how much is this deal worth in US dollars (USD)? If it helps, you can use the conversions:
    - $B(u) = 5u$ to change ***u*** USD to BRL
    - $U(b) = \frac{1}{5}b$ to convert ***b*** BRL to USD

Purchase Supplies: To fulfill the order, you need to buy specialized parts. You have found two possible suppliers:
Supplier 1: One supplier is in Germany, which only accepts payment in euros (EUR). Production and shipping of the parts from Germany cost **95,000 EUR**.
Supplier 2: One supplier is in China, which only accepts payment in Chinese Yuan (CNY). Production and shipping of the parts from China cost **493,000 CNY**.

To file international taxes, you need to invoice these costs in Brazilian reais (BRL).

2. Find the total cost of parts and services from each supplier in Brazilian reais (BRL). For each step, describe what functions you use in what order.

    Current exchange rates are:
    - **1 USD = 5 BRL**
        - $B(u) = 5U$ to convert ***u*** USD to BRL
        - $U(b) = \frac{1}{5}B$ to convert ***b*** USD to USD
    - **1 USD = 0.95 EUR, i.e.**
        - $E(u) = 0.95U$ to convert ***u*** USD to EUR
        - $U(e) = \frac{1}{0.95}E$ to convert ***e*** EUR to USD
    - **1 USD = 7.25 CNY, i.e.**
        - $C(u) = 7.25U$ to convert ***u*** USD to CNY

- $U(c) = \frac{1}{7.25}E$ to convert ***c*** CNY to USD

Cost of Services: In researching both orders, you find that the German parts come with built-in monitoring technology, while the Chinese parts don't. This being the case, the installation will cost **110,000 USD** using the German parts, versus **122,000 USD** for the Chinese parts.

3. Again, for invoicing, you need to record these costs in Brazilian Reais (BRL). What would be the costs for each installation in BRL?

4. What would be the total profit from each deal, in Brazilian Reais (BRL)? Which supplier would you use?

5. If you pay dual corporate tax on profits, 21% tax in the United States and 34% tax in Brazil, how much profit would you make on this deal after taxes (net income, or net profit after tax)? What is your after-tax profit margin (percent after-tax profit of total deal)?
   Optional: How does this after-tax profit margin compare to the profit margin using the other supplier, say, for example, if new tariff laws excluded trade with the more profitable suppliers?

These scenarios demonstrate how analysis of international business deals can often involve multiple conversions which can be efficiently calculated using function composition. The next series of activities develops skills for numerically evaluating such composition.