Problem of the Week
Problem B and Solution
Birthday Presents

Problem

Paula and Quinn are twins. Their friends have saved money to buy them some gifts. Aleta has saved $30, Benji has saved $25, and Carolina has saved $28. They have done some research on possible gifts and their costs:

- Both Paula and Quinn would like a pair of warm socks that are $7 per pair.

- Paula wants some guitar picks for $6 and a yo-yo that is $7.

- Quinn would like some art pencils that are $21.

- Both like chocolate mints that are $4 per box.

(a) If they combine their savings, how much will be left after purchasing these gifts? You may ignore taxes.

(b) Other items they are considering are a hoodie for $20, slippers for $10, a diary for $6, and a water bottle for $16. They also have to buy some wrapping paper and ribbons, which is $5 in total for both twins.

   If they want to spend all their money and also spend about the same total amount on each person, which of the additional items could they buy for each of Paula and Quinn? You may ignore taxes.

Solution

(a) The three friends have saved a total of $30 + $25 + $28 = $83. The gifts cost $(2 \times \$7) + \$6 + \$7 + \$21 + (2 \times \$4) = \$56$ in total. Thus, there will be $83 - $56 = $27 left over.

(b) First we will figure out approximately how much money they should spend on each person. Subtracting $5 for wrapping paper and ribbons, the friends have a total of $83 - $5 = $78 to spend on gifts. So they should spend about $78 \div 2 = \$39$ on each person.

   - After buying the socks, art pencils, and chocolate mints for Quinn, they will have spent $7 + $21 + $4 = $32. Thus, they should spend approximately $39 - $32 = $7 more on gifts for Quinn.
   - After buying the socks, guitar picks, yo-yo, and chocolates for Paula, they will have spent $7 + $6 + $7 + $4 = $24. Thus, they should spend approximately $39 - $24 = $15 more on gifts for Paula.

   After buying the wrapping paper and ribbons, they will have $27 - $5 = $22 left, and want to spend it all on gifts. From the additional items, they can buy a diary and a water bottle for $6 + $16 = $22, or two diaries and a pair of slippers for $6 + $6 + $10 = $22. No other combination of items equals $22.

   So they could buy a diary for $6 for Quinn, and either a water bottle for $16 or a diary and a pair of slippers for $6 + $10 for Paula. Either way they will have spent a total of $32 + $6 = $38 on Quinn and $24 + $16 = $40 on Paula.