Question

Abdullah has decided to make loot bags for his birthday party.
Balloons are sold in bags of 20, party horns are sold in bags of 10, and candy bars are sold in packages of 8. He invited his 36 classmates. How many of each should he buy so there are an equal number of balloons horns and candy bars in each basket? He does not want any leftovers.

Solution

Balloons

Consider $20 = 4 \cdot 5 = 2^2 \cdot 5$ and $36 = 4 \cdot 9 = 2^2 \cdot 3^2$.

LCM of 20 and 36 equals $2^2 \cdot 3^2 \cdot 5 = 4 \cdot 9 \cdot 5 = 180$.

So he should buy $\frac{180}{20} = 9$ bags.

Horns

Consider $10 = 2 \cdot 5$ and $36 = 4 \cdot 9 = 2^2 \cdot 3^2$.

LCM of 10 and 36 equals $2^2 \cdot 3^2 \cdot 5 = 4 \cdot 9 \cdot 5 = 180$.

So he should buy $\frac{180}{10} = 18$ bags.

Candy bars

Consider $8 = 2^3$ and $36 = 4 \cdot 9 = 2^2 \cdot 3^2$.

LCM of 8 and 36 equals $2^3 \cdot 3^2 = 8 \cdot 9 = 72$.

So he should buy $\frac{72}{8} = 9$ packages.

Answer: 9 bags of balloons, 18 bags of horns, 9 packages of candy bars.