Counting What Remains After Two Decays

Scoring guide · one credit per question · review written work against each rubric

Counting What Remains After Two Decays

Question 1

Choice (3)

The 20 P parents are half of their original count, so 40 were present.

Question 2

The 30 remaining Q parents are three quarters of the start, so Q begins with 30 ÷ 0.75 = 40. Ten Q parents decay and make ten daughters.

Question 3

The proposed 50 is too high. Q starts with 40 and ends with 30, so ten of the 30 daughters came from Q. The other 20 came from P. Together with the 20 P parents still present, they give a starting P count of 40.

Question 4

One possible pair is 20 P decays and 10 Q decays. Another is 12 P decays and 18 Q decays. Both give 30 daughters because each decay makes one daughter of the same type. Accept any two distinct pairs of nonnegative whole numbers summing to 30, with an explanation that the daughter detector does not identify the parent.