Solution (#299) With rolls of 4, 2, 1, 3, 2 it means that A, B, C have had 3, 2, 0 favourable rolls respectively. So the game ends once A gets a favourable roll, B two favourable rolls or C four favourable rolls.

The game will definitely end by the fifth roll or earlier. There are $3^5 = 243$ combinations to consider. Combinations where A wins are on the

1st roll: $3^4 = 81$, 2nd roll: $2 \times 3^3 = 54$, 3rd roll: $(2+1) \times 3^2 = 27$, 4th roll: $(3+1) \times 3 = 12$, 5th roll: 4. In all then there are 81 + 54 + 27 + 12 + 4 = 178 ways for A to win.

Combinations where B wins are on the

2nd roll: $3^3 = 27$, 3rd roll: $2 \times 3^2 = 18$, 4th roll: $3 \times 3 = 9$, 5th roll: 4. In all then there are 27 + 18 + 9 + 4 = 58 ways for *B* to win. There are then 243 - 178 - 58 = 7 ways for *C* to win. The money should then be split as

for A:
$$\pounds \frac{178}{81}$$
, for B: $\pounds \frac{58}{81}$, for C: $\pounds \frac{7}{81}$.