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Regulars



Racing certainties: solution

If we discount the favourite (with odds of 1 to 1) and place none of our stake money on him then we are really betting on a three-horse race where Q is equal to

$$Q = \frac{1}{4} + \frac{1}{8} + \frac{2}{5} = \frac{31}{40} < 1,$$

and by betting $\frac{1}{4}$ of our stake money on runner 1, $\frac{1}{8}$ on runner 2, and $\frac{2}{5}$ on runner 3 we are guaranteed a minimum return of $\frac{40}{31} - 1 = \frac{9}{31}$ of our total stake in addition to our original stake money!

In the case of $a_i = i(i+2) - 1$ and an infinite number of runners ($N = \infty$) we have

$$Q = \sum_{i=1}^N \frac{1}{a_i + 1} = \sum_{i=1}^{\infty} \frac{1}{i(i+2)} = \frac{3}{4}.$$



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