Summary. In this article, we consider the question "Given a list of odds on a horse race, is it possible, by betting the right amount on each horse, to win money regardless of the outcome of the race?" Converting the given odds to probabilities and summing those probabilities yields an easily calculated parameter that indicates whether the answer to this question is "yes" or "no." This parameter also determines the percentage of the total amount bet on the race returned to the winning bettors and the percentage retained by the track.

References

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Multiplying by 9

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Here is a quick shortcut for multiplying two-digit numbers by 9. For $AB \times 9$, subtract $A + 1$ from AB and append $10 - B$.

For example, with 68×9, simply compute $68 - 7 = 61$ and append $10 - 8 = 2$ to get 612.

For 94×9, you merge $94 - 10 = 84$ with $10 - 4 = 6$ to obtain 846.

The underlying algebra is that, for a given number $10A + B$ with $0 < B \leq 9$, we are computing

$$10[(10A + B) - (A + 1)] + (10 - B) = 90A + 9B = 9(10A + B).$$

Consequently, this can be applied to larger numbers. For instance, to compute 123×9, merge $123 - 13 = 110$ with $10 - 3 = 7$ to get 1107.

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