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This math magic trick is based on a very simple mathematical fact:

*Each pair of opposite faces on a six-sided die always add up to seven*

In any six-sided die:

- 1 is always opposite 6, thus the sum is  $6 + 1 = 7$  (in this case, 6 is opposite 1)
- 2 is always opposite 5, thus the sum is  $2 + 5 = 7$  (this is the same as 5 being opposite 2)
- 3 is always opposite 4, thus the sum is  $3 + 4 = 7$  you've got that, you're ready for the trick.

### Instructions:

- Hand a friend the three dice and ask them to stack them together so that they form a column (like the figure seen here)
- Turn your back to the person while he/she silently adds up the numbers on the five hidden dice faces. Tell your friend to memorize the sum and keep it a secret.
- When three dice are stacked together there are five faces, that you can't see: the bottom and top faces of the lowest die, the top and bottom faces of the middle die and the bottom face of the top die. Altogether you get five hidden faces.
- When your friend is ready (he/she has figured out the sum of the numbers on the five hidden faces) you can turn around. Tell him/her that you will use your outstanding magical powers to name the sum of the five hidden faces, without looking of course.
- Glance at the top face of the stacked column (in this diagram it is 4), and subtract it from 21 (in this



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