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## Group 5: mathematics

# Card tricks

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Here are further versions of the card trick on p. 19 of the magazine.

By choosing where to place each pile of three cards in one of the top middle or bottom, you can manipulate the ace of spades anywhere.

You can manipulate the ace of spades anywhere in a pile that contains any number of cards, but you have to choose the number of piles that you are going to use and you have to know the theory behind this.

For example, let's try 15 cards:

- Deal a hand of 15 cards from an ordinary pack but make sure the ace of spades is one of the 15 cards.
- Shuffle the cards and deal them, face up, one at a time into five piles. Note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Pick up the five piles one at a time, but make sure that the pile that contains the ace of spades is placed in the middle of the other piles.
- Do not shuffle the cards. Once again, deal them, face up, one at a time into five piles. Again, note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Again, pick up the five piles, making sure that the pile which contains the ace of spades is placed in the middle.
- Do not shuffle the cards. Finally, deal the first seven cards face down. Then deal the next card face up — it is the ace of spades.

...and now 25 cards:

- Deal a hand of 25 cards from an ordinary pack but make sure the ace of spades is one of the 25 cards.
- Shuffle the cards and deal them, face up, one at a time into five piles. Note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Pick up the five piles one at a time, but make sure that the pile that contains the ace of spades is placed in the middle of the other piles.
- Do not shuffle the cards. Once again, deal them, face up, one at a time into five piles. Again, note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Again, pick up the five piles, making sure that the pile that contains the ace of spades is placed in the middle.

- Do not shuffle the cards. Finally, deal the first 12 cards face down. Then deal the next card face up — it is the ace of spades.

...or the card appearing at the top of the pack:

- As before, deal a hand of nine cards from an ordinary pack but make sure the ace of spades is one of the nine cards. Shuffle the cards and deal them, face up, one at a time into three piles. Note the pile in which the ace of spades is placed. Then turn the piles of cards face down. The following three steps determine the final position of the ace of spades.
- Pick up the three piles one at a time, but make sure that the pile that contains the ace of spades is placed on the top of the other two piles.
- Do not shuffle the cards. Once again, deal them, face up, one at a time into three piles. Again, note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Again, pick up the three piles, making sure that the pile which contains the ace of spades is placed on the top.
- Do not shuffle the cards. Turn over the top card — it is the ace of spades.

...or in the eighth position:

- Pick up the three piles one at a time, but make sure that the pile that contains the ace of spades is placed in the middle of the other piles.
- Do not shuffle the cards. Once again, deal them, face up, one at a time into three piles. Again, note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Again, pick up the three piles, making sure that the pile that contains the ace of spades is placed on the bottom.
- Do not shuffle the cards. Turn over the eighth card — it is the ace of spades.

And finally, we place the ace of spades in the fourth position:

- Pick up the three piles one at a time, but make sure that the pile that contains the ace of spades is placed on the top of the other two piles.
- Do not shuffle the cards. Once again, deal them, face up, one at a time into three piles. Again, note the pile in which the ace of spades is placed. Then turn the piles of cards face down.
- Again, pick up the three piles, making sure that the pile that contains the ace of spades is placed in the middle.
- Do not shuffle the cards. Turn over the fourth card — it is the ace of spades.