



Puzzle provided by Kordemsky: The Moscow Puzzles (Dover)

One invention saves 30% on fuel; a second, 45%; and a third, 25%. If you use all three inventions at once can you save 100%? If not, how much?



Solution: No invention can save 100% on fuel, since energy cannot arise from nothing. The correct calculation is not $30\% + 45\% + 25\% = 100\%$, but:

$$100\% - (100\% - 30\%) (100\% - 45\%) (100\% - 25\%)$$
$$= 100\% - (70\% \times 55\% \times 75\%) = 71.125\%.$$

This assumes the three inventions are independent in effect.