1. Suppose that someone holds two pennies, two nickels, and two quarters and randomly selects and gives you three of these six coins.

   Compute the probability that you receive exactly 31 cents.

The only way to form 31 cents with these coins is with one penny, one nickel, and one quarter.

There are 2 choices for the penny;
2 choices for the nickel; and
2 choices for the quarter.

Hence, using the product rule, you have

$2 \times 2 \times 2 = 8$ ways to receive 31 cents.

There are in total $\binom{6}{3} = \frac{6 \times 5 \times 4}{3 \times 2 \times 1} = 20$ ways for three of the six coins to be selected.

Therefore, the probability that you receive exactly 31 cents is

$$\frac{8}{20} = \frac{2}{5} = 0.4.$$