

## Binomial Pattern

$$(a+b)(c+d) = ac + ad + bc + bd$$

$$(100+x)(100+y) = 10,000 + \textcolor{red}{100y + 100x} + xy$$

$$(100+x)(100+y) = 10,000 + \textcolor{red}{(x+y)100} + xy$$

## Mental Math

$$\begin{aligned}(103)(102) &= (100 + 3)(100 + 2) = 10,000 + 200 + 300 + 6 \\&= 10,506\end{aligned}$$

$$\begin{aligned}(104)(102) &= (100 + 4)(100 + 2) = 10,000 + 200 + 400 + 8 \\&= 10,608\end{aligned}$$

$$\begin{aligned}(105)(103) &= (100 + 5)(100 + 3) = 10,000 + 300 + 500 + 15 \\&= 10,815\end{aligned}$$

$$\begin{aligned}(98)(97) &= (100 - 2)(100 - 3) = 10,000 - 300 - 200 + 6 \\&= 9,506\end{aligned}$$

$$\begin{aligned}(103)(98) &= (100 + 3)(100 - 2) = 10,000 - 200 + 300 - 6 \\&= 10,094\end{aligned}$$