

Name _____

Squaring Numbers

Find the Square of large number using decomposition.

$\begin{aligned} 1) 10002^2 &= \underline{100040004} \\ &= (1000 + 2)^2 \\ &= (1000)^2 + 2(1000)(2) + (2)^2 \\ &= 10000000 + 4000 + 4 \\ &= 100040004 \end{aligned}$	$\begin{aligned} 2) 19998^2 &= \underline{399920004} \\ &= (20000 - 2)^2 \\ &= (20000)^2 - 2(20000)(2) + (2)^2 \\ &= 400000000 - 80000 + 4 \\ &= 399920004 \end{aligned}$
$\begin{aligned} 3) 75002^2 &= \underline{5625300004} \\ &= (75000 + 2)^2 \\ &= (75000)^2 + 2(75000)(2) + (2)^2 \\ &= 5625000000 + 300000 + 4 \\ &= 5625300004 \end{aligned}$	$\begin{aligned} 4) 9995^2 &= \underline{99990025} \\ &= (10000 - 5)^2 \\ &= (10000)^2 - 2(10000)(5) + (5)^2 \\ &= 100000000 - 100000 + 25 \\ &= 99990025 \end{aligned}$
$\begin{aligned} 5) 49996^2 &= \underline{2499600016} \\ &= (50000 - 4)^2 \\ &= (50000)^2 - 2(50000)(4) + (4)^2 \\ &= 2500000000 - 400000 + 16 \\ &= 2499600016 \end{aligned}$	$\begin{aligned} 6) 10012^2 &= \underline{100240144} \\ &= (10000 + 12)^2 \\ &= (10000)^2 + 2(10000)(12) + (12)^2 \\ &= 100000000 + 240000 + 144 \\ &= 100240144 \end{aligned}$
$\begin{aligned} 7) 40008^2 &= \underline{1600640064} \\ &= (40000 + 8)^2 \\ &= (40000)^2 + 2(40000)(8) + (8)^2 \\ &= 1600000000 + 640000 + 64 \\ &= 1600640064 \end{aligned}$	$\begin{aligned} 8) 9991^2 &= \underline{9982081} \\ &= (10000 - 9)^2 \\ &= (10000)^2 - 2(10000)(9) + (9)^2 \\ &= 100000000 - 180000 + 81 \\ &= 9982081 \end{aligned}$