Palindromes

The same forwards and backwards

Ex: 5, 22, 313, 12345432 1

Find the # of 4-digit palindromes

$\underline{a}\ \underline{b}\ \underline{b}\ \underline{a}$

$9 \cdot 10 \cdot 1 \cdot 1 = \boxed{90}$

Find the greatest # that divides all 4-digit palindromes

$abba = 1000a + 100b + 10b + a = 1001a + 110b$

$\gcd(1001, 110) = \gcd(7 \cdot 11 \cdot 13, 2 \cdot 5 \cdot 11) = \boxed{11}$

Find the smallest 3-digit palindrome whose product with 101 is not a 5-digit palindrome

aba

$\cdot 101$

aba

0000

$+\ aba\,00$

$abyaba$

$a = 5$

$b = 0$

505

$\times 101$

505

505

50505