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**Title:** On the simultaneous equations  $\sigma(2^a) = p^{f_1} q^{g_1}$ ,  $\sigma(3^b) = p^{f_2} q^{g_2}$ ,  $\sigma(5^c) = p^{f_3} q^{g_3}$

**Author(s):** Tomohiro Yamada

Let  $\sigma(N)$  denote the sum of divisors of  $N$ . We shall solve the simultaneous equations  $\sigma(2^a) = p^{f_1} q^{g_1}$ ,  $\sigma(3^b) = p^{f_2} q^{g_2}$ ,  $\sigma(5^c) = p^{f_3} q^{g_3}$  with  $p, q$  distinct primes.

**Address:**

Tomohiro Yamada  
Center for Japanese  
Language and Culture  
Osaka University  
8-1-1, Aomatanihigashi  
Minoo, Osaka - 562-8558  
Japan