Substituting the value of 7 from (18) in (17), we get

$$(4^8+8^8)(x^8+16y^8)^8+(16^8+15^8+2^8)\{(4x^5y^3)^8+(8x^3y^5)^8\}$$
$$= (4^8+8^8)\{(x^8-16y^8)^8+(2x^7y)^8+(16xy^7)^8\}+17^8\{(4x^5y^3)^8+(8x^3y^5)^8\}.$$

Division by 4^8 now gives

$$(1^8+2^8)(x^8+16y^8)^8+(16^8+15^8+2^8)\{(x^5y^3)^8+(2x^3y^5)^8\}$$
$$= (1^8+2^8)\{(x^8-16y^8)^8+(2x^7y)^8+(16xy^7)^8\}+17^8\{(x^5y^3)^8+(2x^3y^5)^8\},$$

and the proof of (IX) is complete.

LEUDESDORF'S GENERALIZATION OF WOLSTENHOLME'S THEOREM

S. CHOWLA*.

THEOREM†. *If* $(n, 6) = 1$, *then*‡

$$\sum_{\substack{(m,n)=1\\ m<n}} m^{-1} \equiv 0(n^2).$$

Proof§.

$$\sum_{\substack{(m,n)=1\\ m<n}} \frac{1}{m} \equiv 0(n^2) \rightleftarrows \sum_{\substack{(m,n)=1\\ m<n}} \frac{1}{m(n-m)} \equiv 0(n),$$

$$\sum_{\substack{(m,n)=1\\ m<n}} \frac{1}{m(n-m)} + \sum_{\substack{(m,n)=1\\ m<n}} \frac{1}{m^2} \equiv 0(n).$$

It remains to prove that‖ $\Sigma' m^{-2} \equiv 0(n)$, and this follows from the congruence

$$\Sigma' m^{-2} \equiv \Sigma'(am)^{-2} \pmod n,$$

if a is such that $a^2 \not\equiv 1(p)$ for all prime factors p of n; it is obviously possible to choose a in this way since n is prime to 6.

* Received 27 March, 1934; read 26 April, 1934.

† This is the simplest and most striking case of Leudesdorf's theorem. See Hardy and Wright, *Journal London Math. Soc.*, 9 (1934), 38–41. The theorem was rediscovered by S. S. Pillai.

‡ $a \equiv b(c)$ means $a \equiv b \pmod c$.

§ We write $A \rightleftarrows B$ when proposition B follows from proposition A and conversely.

‖ A dash attached to a Σ indicates that m takes any incongruent set of values prime to n.