1081. *Proposed by Tom Moore, Bridgewater State College, Bridgewater, MA.*

Let t_n be the n'th triangular number, defined by $t_1 = 1$, and $t_n = t_{n-1} + n$ for all $n \geq 2$. Prove that $\gcd(t_{n-1}, t_n) \cdot \gcd(t_n, t_{n+1}) = t_n$ for all $n \geq 2$.

Solution by **Rex H. Wu**, *Brooklyn, NY.*

$$\begin{aligned} t_{n-1} &= \frac{(n-1)n}{2} \\ t_n &= \frac{n(n+1)}{2} \\ t_{n+1} &= \frac{(n+1)(n+2)}{2} \end{aligned}$$

If n is even, then $\gcd(t_{n-1}, t_n)=n/2$ and $\gcd(t_n, t_{n+1}) = (n+1)$.

If n is odd, then $\gcd(t_{n-1}, t_n)=n$ and $\gcd(t_n, t_{n+1}) = (n+1)/2$.

In either case, $\gcd(t_{n-1}, t_n) \cdot \gcd(t_n, t_{n+1}) = t_n = n(n+1)/2$.

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