

**12256.** *Proposed by Paul Bracken, University of Texas, Edinburg, TX. Prove*

$$\int_0^1 \frac{\log(1+x)\log(1-x)}{x} dx = -\frac{5}{8}\zeta(3),$$

where  $\zeta(3)$  is Apéry's constant  $\sum_{n=1}^{\infty} 1/n^3$ .