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We present short new proofs of the irrationality of  $\tan r$  for  $r \in \mathbb{Q} \setminus \{0\}$  and  $\cos r$  for  $r^2 \in \mathbb{Q} \setminus \{0\}$ . We also discuss applications of our technique to simpler irrationality proofs such as those for  $\pi$ ,  $\pi^2$ , and certain values of exponential and hyperbolic functions. (Received July 12, 2009)