17. Prove the following generalization employing the method of direct proof. Employ excellent style.

Prove: The product of any two odd integers is odd.

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Suppose m and n are arbitrary, but particular, odd integers. By the definition of odd, there exists some integer k such that $m = 2k + 1$. There also exists some integer r such that $n = 2r + 1$. We are to show that the product of any two odd integers is odd. We can say that $m \cdot n = (2k+1)(2r+$ by substitution. So,

$$
\begin{aligned}
m \cdot n &= (2k+1)(2r+1) \\
&= 4 \cdot kr + 2k + 2r + 1 \\
&= 2(2kr + k + r) + 1
\end{aligned}
$$

We know that there exists some integer s, such that $s = 2kr + k + r$ because integers are closed under multiplication and addition. So, $m \cdot n = 2s + 1$, ~~and~~ By the definition of odd, $m \cdot n$ is odd.

Hence the product of any two odd integers is odd.