ER 1.2.4c If m and n are odd integers, then $mn+7$ is an even integer.

Instructions: Prove using definition of even and odd.

good intro. ¶

Proof: $\boxed{\text{Let } m \text{ and } n \text{ be odd integers. We will show that } mn+7 \text{ is even.}}$ Since m and n are odd integers, there exists $k_m, k_n \in \mathbb{Z}$ so that

$$m = 2k_m + 1 \qquad (1)$$

and

$$n = 2k_n + 1. \qquad (2)$$

By (1) and (2), followed by algebra, we get

$$\begin{aligned} mn+7 &= (2k_m+1)(2k_n+1) + 7 \\ &= 4k_mk_n + 2k_m + 2k_n + 1 + 7 \\ &= 4k_mk_n + 2k_m + 2k_n + 8 \\ &= 2(2k_mk_n + k_m + k_n + 4) \\ &= 2q \end{aligned}$$

where $q = 2k_mk_n + k_m + k_n + 4$. Since $k_m, k_n \in \mathbb{Z}$ and the $\mathbb{Z}$ is closed under multiplication and addition, $q \in \mathbb{Z}$. Thus $mn+7 = 2q$ for ~~some~~ $q \in \mathbb{Z}$. So, definition of even, $mn+7$ is even.

We have just shown that if m and n are odd integers, then $mn+7$ is even. ∎

Concluding paragraph

$\boxed{\text{Not correct introductory ¶}}$

= is = be

Proof: Let m and n be odd integers. We will that if m and n are odd integers, then $mn+7$ is an even integer.

→ Prof G calls this mistake; IS ≠ IF.

$\boxed{\text{Easy fix (well on LaTex) for this?}}$

Proof: We will show that if m and n are odd integers, then $mn+7$ is an even integer. Let m and n be odd integers.