21. What is the sum of the values of n for which both n and $\dfrac{n^2-9}{n-1}$ are integers?

A -8 B -4 C 0 D 4 E 8

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21. **E** Note that $n^2 - 1$ is divisible by $n - 1$. Thus:

$$\frac{n^2-9}{n-1} = \frac{n^2-1}{n-1} - \frac{8}{n-1} = n + 1 - \frac{8}{n-1} \qquad (n \neq 1).$$

So, if n is an integer, then $\dfrac{n^2-9}{n-1}$ is an integer if and only if $n - 1$ divides exactly into 8.
The possible values of $n-1$ are $-8, -4, -2, -1, 1, 2, 4, 8$, so n is $-7, -3, -1, 0, 2, 3, 5, 9$.
The sum of these values is 8.
(*Note that the sum of the 8 values of $n-1$ is clearly 0, so the sum of the 8 values of n is 8.*)