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Quiz 6 S17

$$T(n) = \begin{cases} 5 & n \le 2 \\ T(n-2)+3 & n > 2 \end{cases}$$

$n - \underbrace{2-2-2-2\ldots-2}_{k}$ ↷ Finding how many times $T(n)$ will recurse until we reach the base case:

$T(n) = T(n-2)+3$
$T(n-2) = T(n-4)+3$
$T(n-4) = T(n-6)+3$

$n - 2k \le 2$
$\frac{n-2}{2} \le \frac{2k}{2}$
$\frac{n-2}{2} \le k$
↖ How many times $T(n)$ will recurse until we reach base case

$T(n) = T(n-2)+3$
$= [T(n-4)+3]+3$
$= [[T(n-6)+3]+3]+3]$

$\sum_{i=0}^{\frac{n-2}{2}} 3i$

$T(n) =$ (cost of base case)(# of times base case is reached) $+ \sum_{i=0}^{\frac{n-2}{2}} 3i$

$= (5)(1^k) + 3\sum_{i=0}^{\frac{n-2}{2}} i$

$= (5) + 3\left(\frac{\frac{n-2}{2}\left(\frac{n-2}{2}+1\right)}{2}\right)$

$= (5) + 3\left(\frac{\left(\frac{n-2}{2}\right)\left(\frac{n-2}{2}+\frac{2}{2}\right)}{2}\right)$

$= (5) + 3\left(\frac{\left(\frac{n-2}{2}\right)\left(\frac{n}{2}\right)}{2}\right)$