## Invalid recursion

Three of the following function definitions are not valid, each for a different reason. Which one is valid, and what's wrong with each of the others? (Domains and codomains are not provided, but assume they're always something sensible.)

$$f(n) = \begin{cases} 8 & \text{when } n < 9 \\ n + f(n-2) & \text{when } n \geq 9 \end{cases}$$

$$g(n) = \begin{cases} -9 & \text{when } n = 6 \\ n + g(n-1) & \text{when } n > 7 \end{cases}$$

$$h(n) = \begin{cases} 3 & \text{when } n = 6 \\ n + h(n+1) & \text{when } n \geq 7 \end{cases}$$

$$s(n) = \begin{cases} 2 & \text{when } n \leq 7 \\ n + s(n-1) & \text{when } n > 6 \end{cases}$$