

ALGORITHM 13.3. $u^h = \text{V-Cycle}(A_h, u_0^h, f^h)$

1. *Presmooth:* $u^h := \text{smooth}^{v_1}(A_h, u_0^h, f^h)$
2. *Get residual:* $r^h = f^h - A_h u^h$
3. *Coarsen:* $r^H = I_h^H r^h$
4. *If* ($H == h_0$)
 5. *Solve:* $A_H \delta^H = r^H$
6. *Else*
 7. *Recursion:* $\delta^H = \text{V-cycle}(A_H, 0, r^H)$
8. *EndIf*
9. *Correct:* $u^h := u^h + I_H^h \delta^H$
10. *Postsmooth:* $u^h := \text{smooth}^{v_2}(A_h, u^h, f^h)$
11. *Return* u^h