

Assignment # 8 Sample

1. Use reduction from **Halt** to show that one cannot decide **REPEATS**, where **REPEATS** = { f | for some x and y , $x \neq y$, $\varphi_f(x) \downarrow$, $\varphi_f(y) \downarrow$ and $\varphi_f(x) == \varphi_f(y)$ }
2. Show that **REPEATS** reduces to **Halt**. (1 plus 2 show they are equally hard)
3. Use Reduction from **Total** to show that **DOUBLES** is not even re, where **DOUBLES** = { f | for all x , $\varphi_f(x) \downarrow$, $\varphi_f(x+1) \downarrow$ and $\varphi_f(x+1) = 2 * \varphi_f(x)$ }
4. Show **DOUBLES** reduces to **Total**. (3 plus 4 show they are equally hard)
5. Use Rice's Theorem to show that **REPEATS** is undecidable
6. Use Rice's Theorem to show that **DOUBLES** is undecidable