So, BNE is like this,

$S_b^*(t_b) = L$ (Lend)

$S_f^*(t_p) = T$ (struggle)

$S_f^*(t_{np}) = S$ (shirk)

so, if profitable project is chosen, bank's BNE is L, and firm's BNE is T. So, we can verify that note like this flow.

10.

(a) $V_C = 6 + 6\cdot\delta + \cdots = \frac{6}{1-\delta}$

$V_D = 4 + 4\cdot\delta + \cdots = \frac{4}{1-\delta}$

if history is C, payoff matrix is like this,

1 \ 2	C	D
C	$\underline{6+\delta\cdot V_C}$ $6+\delta\cdot V_C$	$\underline{2+\delta\cdot V_D}$ $8+\delta\cdot V_D$
D	$\underline{8+\delta\cdot V_D}$ $2+\delta\cdot V_D$	$\underline{4+\delta\cdot V_D}$ $4+\delta\cdot V_D$

~~If~~ to pass single deviation test with grim trigger strategy,

$6+\delta\cdot V_C \geq 8+\delta\cdot V_D$ ~~and $2+\delta\cdot V_D$~~

$6+\delta\cdot\frac{6}{1-\delta} \geq 8+\delta\cdot\frac{4}{1-\delta}$

$\frac{2\delta}{1-\delta} \geq 2$

$2\cdot\delta \geq 2-2\delta$

$4\delta \geq 2$

$\delta \geq \frac{1}{2}$

$\therefore \frac{1}{2} \leq \delta < 1$

we need this condition