8. Suppose that two motorcycle manufacturers, Honda and Suzuki, are considering offering 10-year full coverage warranties for their new motorcycles. Although the warranties are expensive to offer, it could be disastrous for one firm if it does not offer a warranty while its competitor does. Let's assume the payoffs for the firms are as follows:

Honda \ Suzuki	*Offer Warranty*	*Don't Offer*
Offer Warranty	20, 20	120, 10
Don't Offer	10, 120	50, 50

(a) If the game is played once, what is the Nash equilibrium? (3 points)

(offer Warranty, offer warranty)

(b) Suppose the game is repeated three times. Will the outcome of (a) change from your answer in (a)? Explain. (6 points)

In this finite repeated game, each game's nash eq. is independent from other stage. So Nash equilibrium isn't change.

(c) Now, suppose the game is infinitely repeated and Suzuki and Honda formed an agreement to "not offer" warranties to their customers. Each firm plans the use of a grim-trigger strategy to encourage compliance with the agreement. At what level of δ (discount factor) would Honda be indifferent about keeping the agreement vs. cheating on it? Explain. (8 points)

to use augmented game, let's get present value from agreement and cheating

$V_a = 50 + 50\delta + \dots = \frac{50}{1-\delta}$

$V_c = 20 + 20\delta + \dots = \frac{20}{1-\delta}$

	Offer	Don't offer
Offer	$20+\delta V_c$, $20+\delta V_c$	$120+\delta V_c$, $10+\delta V_c$
Don't	$10+\delta V_c$, $120+\delta V_c$	$50+\delta V_a$, $50+\delta V_a$

in history aggrement to (Don't offer, Don't offer) be SPNE, $120+\delta\frac{20}{1-\delta} \le 50+\delta\frac{50}{1-\delta}$

$\therefore \frac{7}{10} \le \delta < 1$

and then, payoff matrix is like

when history is agreement

when history is cheating →

	offer	Don't
offer	$20+\delta V_c$, $20+\delta V_c$	$20+\delta V_c$, $10+\delta V_c$
Don't	$10+\delta V_c$, $120+\delta V_c$	$50+\delta V_c$, $50+\delta V_c$

→ absolutely offer, offer in history cheating