

DENISE AND CHAD

Use the following background information and definitions to answer the questions below.

- * A person “likes” another person if they have a positive affection for them.
- * A person is happy when he or she is “liked” by someone else. A person is unhappy if they he or she is disliked by someone.
- * A couple is “happy” when they both like each other. A couple is unhappy when they both dislike each other.
- * Denise and Chad meet at time $t = 0$ where t is measured in weeks.
- * Denise’s affection for Chad is characterized by $\sin\left(\frac{9\pi t}{10}\right)$ for $0 \leq t \leq a$ for some constant a .
Otherwise her affection has the value of zero.
- * Chad’s affection for Denise is characterized by $2\sin\left(\frac{7\pi t}{10}\right)$ for $0 \leq t \leq a$ for some constant a .
Otherwise his affection has the value of -2 .

1. Who has the greater emotional range? What is that range?
2. Whose emotions fluctuate most rapidly? What is that fluctuation?
3. When did Denise and Chad have no feelings for each other, but their affections were increasing?
4. When did Denise like Chad intensely, but Chad disliked Denise intensely?
5. When was Denise a “happy” individual?
6. When were Denise and Chad “happy” as a couple?
7. Find the value of a and describe their relationship for $t > a$.
8. During the time $0 \leq t \leq a$, what percent of the time were Denise and Chad “happy” as a couple?

