Clicker-less Questions for April 28
What is the difference between
   (define bobs (cons 'bob bobs))
and
   (define bob$ (cons$ 'bob bob$))

A. bobs is a valid list and bob$ is a valid stream
B. bobs is an infinite recursion and bob$ is a valid stream
C. bobs is a valid list and bob$ isn't worth $1
D. No difference -- both are infinite recursions
(define bobs (cons 'bob bobs))

and

(define bob$ (cons$ 'bob bob$))

Answer B: bobs is an infinite recursion and bob$ is a perfectly valid and delightful stream.
I want to define the stream Evens$ of even integers: 0 2 4 6 etc. What does this calculation tell you:

\[
\begin{array}{cccccccccccc}
0 & 2 & 4 & 6 & 8 & 10 & 12 & 14 & 16 & 18 & \ldots
\end{array}
\]

\[
\begin{array}{cccccccccccc}
+2 & & & & & & & & & &
\end{array}
\]

\[
\begin{array}{cccccccccccc}
2 & 4 & 6 & 8 & 10 & 12 & 14 & 16 & 18 & \ldots
\end{array}
\]

A. (define Evens$ (cons$ 0 (+$ 2 Evens$)))
B. (define Evens$ (cons$ 0 (cdr$ Evens$)))
C. (define Evens$ (cons$ 0 (map$ (lambda (x) (+ 2 x)) Evens$)))
D. It tells me that streams are very weird.
Answer C:
\[ \text{(define Evens}\$ (\text{cons}\$ 0 (\text{map}\$ (\lambda (x) (+ 2 x)) \text{Evens}\$)))} \]
This one is a hint for one of the lab exercises. What is an easy way to make the stream of alternating 1 and -1: $\text{Alts$} = 1 -1 1 -1 1 -1 ....$?

A. If you square every element you get the stream of 1s:
   $\text{One$} = 1 1 1 ...$
B. If you add $\text{Alts$}$ to ($\text{cdr$} \text{Alts$}$) you get the stream of 0s:
   $\text{Zero$} = 0 0 0 0 ... = (\text{cons$} 0 \text{Zero$})$
C. If you multiply $\text{Alts$}$ by -1 and $\text{cons$} 1$ onto the front you get $\text{Alts$}$ back.
D. (define $\text{Alts$} (\text{cons$} 1 (\text{cons$} -1 \text{Alts$})))$
Alts$ = 1 -1 1 -1 1 -1 ....

Answer D: (define Alts$ (cons$ 1 (cons$ -1 Alts$)))

Answer C also works:
(define Alts$ (cons$ 1 (map$ (lambda (x) (* -1 x)) Alts$)))