Clicker Questions
October 16
What is an environment?

A. A nesting place for variables where they can feel warm and happy.
B. All of the values that are known to the program.
C. The current spot in the computation.
D. A list of (symbol value) pairs; each pair is called a "binding".
Answer D: A list of (symbol value) pairs.
What does a lambda expression evaluate to?

A. A closure.
B. A closure.
C. A closure.
D. A closure.

What is a closure? It is a triple:
• parameter list from the lambda expression
• unevaluated body of the lambda expression
• the environment that was in place at the time the lambda expression was evaluated
Suppose we have a closure with parameter list \((x\ y\ z)\), body \(b\), and environment \(E\). What happens if we apply (call) this closure to the arguments 3, 5, and 9?

Environment \(E\) is extended with new bindings of \(x\) to 3, \(y\) to 5, and \(z\) to 9. Call this extended environment \(E'\). The closure body, \(b\), is then evaluated in \(E'\).
What does the following evaluate to?
(let ([a 3])
   (let ([f (lambda (x) (+ x a))])
      (let ([a 300])
         (f 5))))

A. This is an invalid expression
B. This is a reasonable expression that evaluates to 8.
C. This is a reasonable expression that evaluates to 305.
D. This is a valid but unreasonable expression and any self-respecting Scheme interpreter will refuse to evaluate it.
Answer B: This is a perfectly reasonable expression that evaluates to 8.
Suppose we have two definitions:

\[
\text{(define } \text{Foo (lambda (a) (lambda (x) (+ x a)))})
\]

\[
\text{(define f (Foo 23))}
\]

What is (f 5)?

A. 28
B. 23
C. An error.
D. A closure.
Answer A: 28