Clicker Questions
September 11
\begin{verbatim}
(define f
  (lambda (x)
    (lambda (y) (if (< y x) x y))))
\end{verbatim}

What is \((f 3)\)?

A. An error.
B. #t
C. A function; if we give this function an argument \(y\) it returns the smaller of \(y\) and 3. So \(((f 3) 1)\) is 1 and \(((f 3) 10)\) is 3
D. A function; if we give this function an argument \(y\) it returns the larger of \(y\) and 3. So \(((f 3) 1)\) is 3 and \(((f 3) 10)\) is 10
(define f
  (lambda (x)
    (lambda (y) (if (< y x) x y))))

What is (f 3)?

Answer D: A function; if we give this function an argument y it returns the larger of y and 3. So ((f 3) 1) is 3 and ((f 3) 10) is 10
What is the difference between:

(\text{define } f \\
 (\text{lambda } (n) \\
 \hspace{1em} (\text{let } ([\text{base } 1]) \\
 \hspace{2em} (\text{if } (< n \text{ base}) \\
 \hspace{3em} \text{base} \\
 \hspace{4em} (* n f (- n 1)

(\text{define } g \\
 (\text{let } ([\text{base } 1]) \\
 (\text{lambda } (n) \\
 \hspace{1em} (\text{if } (< n \text{ base}) \\
 \hspace{2em} \text{base} \\
 \hspace{4em} (* n \text{ g (- n 1)

A. f is the factorial function, g gives an error. 
B. g is the factorial function, f gives an error
C. Both are correct, f is more efficient
D. Both are correct, g is more efficient
Answer D: Both are correct, g is more efficient
What is the difference between the two expressions

( (lambda (x y) (* (+ x 2) y)) 3 4)

(let ([x 3] [y 4] )
  (* (+ x 2) y))

A. The first evaluates to 18 and the second to 20.
B. Both evaluate to 20 but the first is more efficient.
C. Both evaluate to 20 but the second is more efficient.
D. There is no difference
Answer D: There is no difference

Both expressions are evaluated by extending the current environment with bindings of $x$ to 3 and $y$ to 4, and then evaluating $(* (+ x 2) y))$ in this extended environment.