CS135 Tutorial 09

Functions as First Class Values
Lines

;;; (line1 x) evaluates $y = 2x + 3$ at $x$.
(define (line1 x)
  (+ (* x 2) 3))

Write a function, points, that evaluates line1 between two values at regular intervals, producing a list of the x and y values.
Lines

Write functions that evaluate the lines represented by the following functions between two values (inclusive) at regular intervals, producing a list of the x and y values.

```
(define (line2 x) (+ (* x 3) -2))
(define (line3 x) (+ (* x -3/2) 0))
(define (line4 x) (+ (* x 4) 1))
(define (line5 x) (+ (* x (sqrt 2)) -2))
(define (quad1 x) (+ (* x x) (* x 2) (* x 3) -4))
```
A Fancier points Function

(require "graphing.rkt")

;;; (line1 x) evaluates $y = 2x + 3$ at $x$.  
(define (line1 x) 
  (+ (* x 2) 3))

(graph line1 5)
Making Lines

We foresee a great future for graphing lines. Mathematicians and engineers from all over the world will be breaking down our doors to buy our incredible software!

But… they need an easier way to make line functions.

Write `make-line`, a function that consumes a slope ($m$) and y-intercept ($b$) and produces a function that consumes $x$ and produces $y = mx+b$. 
Using Lambda

What are the opportunities to use lambda to with the graph example?