Problem Set 10   10/20/04

4.3 # 4, 5

Problem 4.

(a) First, we find the slope m of the line, $m = \frac{550-700}{600} = -\frac{150}{600} = -\frac{1}{4}$. The equation of the line becomes $p - 700 = -\frac{1}{4}(q - 2400)$ or $p = -\frac{1}{4}q + 1300$

(b) With increase in demand the price per item increases

Problem 5.

(a) We want to find the formula for the linear function $F(C)$, where C is degrees Celsius and F is the corresponding degrees Fahrenheit. We have two points on the graph of F: $(0, 32)$ and $(100, 212)$. Now the slope of $F(C)$ is $m = \frac{212-32}{100} = \frac{9}{5}$, using the point-slope form of a line, we have $F - 32 = \frac{9}{5}(C - 0)$. Therefore, $F(C) = \frac{9}{5}C + 32$

(b) $F(C) = \frac{9}{5}C + 32 \Rightarrow F - 32 = \frac{9}{5}C \Rightarrow C(F) = \frac{5}{9}(F - 32) = \frac{5}{9}F - \frac{160}{9}$.

(c) Since 1 degree Kelvin = 1 degree Celsius, the slope of the linear function $K(C)$, where C is degrees Celsius and K is degrees Kelvin, is 1. As $(0, 273.15)$ is on graph of $K(C)$, we have $K(C) = c + 273.15$

(d) $K(C(F)) = C(F) + 273.15 = \frac{5}{9}F - \frac{160}{9} + 273.15 = \frac{5}{9}F + \frac{45,967}{180}$.