Choose one of the following to do. If you do both, only the first will be graded!

1. Maximize $6x + 2y$ subject to the following constraints:

   \[ x \geq 0, \quad y \geq 0, \quad 3x + 2y \leq 10, \quad 2x + 3y \leq 10. \]

   When you graph the inequalities, you get a region with four corners: $(0,0)$, $(0,10/3)$, $(2,2)$ (this is the point where the lines $3x + 2y = 10$ and $2x + 3y = 10$ intersect) and $(10/3,0)$. Plugging these into $6x + 2y$ gives $0$, $20/3$, $16$ and $20$, respectively. The maximum value is 20.

2. What is the average rate of change of $y = x^2$ from $x = 1.5$ to $x = 2$?

   The output values are $y = 1.5^2 = 2.25$ when $x = 1.5$ and $y = 2^2 = 4$ when $x = 2$. The output changes $4 - 2.25 = 1.75$. The input changes $2 - 1.5 = .5$, so the average rate of change is $1.75 / .5 = 3.5$ (or $7/2$ if you prefer fractions to decimals).