Problem 1. *A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 12 in. by 20 in. by cutting out equal squares of side x in. at each corner and then folding up the sides. Express the volume V of the box as a function of x.*

Problem 2. *A cell phone plan has a basic charge of \$35 per month. The plan includes 400 free minutes and charges 10 cents for each additional minute of usage. Write the monthly cost C as a function of the number x of minutes used and graph C as a function of x for $0 \leq x \leq 600$.*

Problem 3. *Suppose the maximum speed permitted on a highway is 65 mi/h and the minimum speed is 40 mi/h. Suppose also that the fine for violating either speed limit is \$15 for every mile per hour past the limit. Express the amount of the fine F as a function of the driving speed x and graph $F(x)$ for $0 \leq x \leq 100$.*

Problem 4. *Suppose we have the following income tax system: for the first \$10,000 there is no tax. Any income past \$10,000 is taxed at 10%, up to an income of \$20,000. After than, any additional income is taxed at 20%.*

1. *Write the amount of tax paid as a function of the income, and graph it.*
2. *What is the tax rate on your entire income if you make \$10,500?*
3. *Write the percent tax on your entire income, as a function of your income, and graph it.*