$\overline{X} = 80.7\%$

No work = no credit

1.) I get so many compliments on my fur hat (ushanka) that I have decided to go into business. I estimate it will cost me $1250 to sell 30 hats and $2750 to sell 90 hats.

  a.) Find a linear model for the cost.

$$C(x) = 25x + 50$$

  b.) If hats sell for $65 each, what is the revenue function?

$$R(x) = 65x$$

  c.) Find the profit function $P(x)$ and interpret $\overline{MP}$

$$P(x) = 40x - 500$$

$\overline{MP} = 40$ which means that profit increases $40 per hat sold.

  d.) Find and interpret the P intercept of the profit function.

$P(0) = -500$ which means the fixed costs are $500.

2.) Consider the graph of f given below. Use it to answer the following.

a.) $f(3) =$ -1

b.) $f(4) =$ undefined

c.) $f(x) = -2$ $x = -3$ or $x = 2$
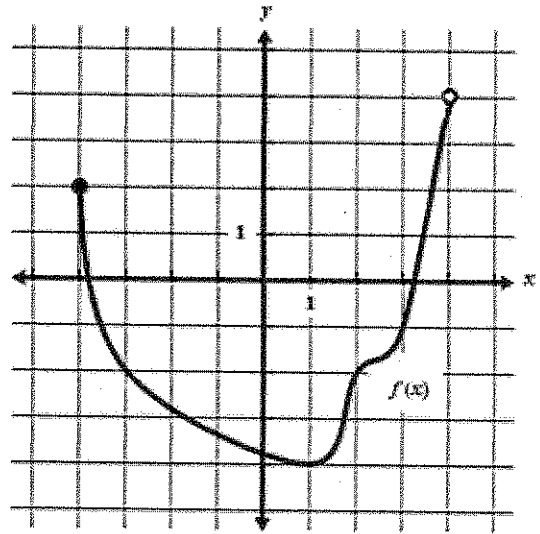
d.) $f(x) = -4$ $x = 1$

e.) f has a minimum at: $(1, -4)$

f.) Find and interpret $\dfrac{f(1) - f(-3)}{1 - (-3)}$ $-\frac{1}{2}$

$$\frac{-4 - (-2)}{4} = -\frac{1}{2}$$

The average Roc of f on $[-3, 1]$ is $-\frac{1}{2}$.

g.) Domain: $[-4, 4)$ and Range: $[-4, 4)$

3.) The functions $2p - q = 50$ and $pq = 100 + 20q$ represent the demand and supply for a product where q is given in 10's of units and p in hundreds of dollars. Graph these on your calculator and find a good viewing window that clearly shows the general shape of the graphs.

Sketch the graph. Label your axes and correctly label the curves as demand and supply. What is your window? Use your calculator to find the intersection point. Then interpret it within the context of the problem.

$$P = \frac{q + 50}{2} \quad \text{and} \quad p = \frac{100}{q} + 20$$
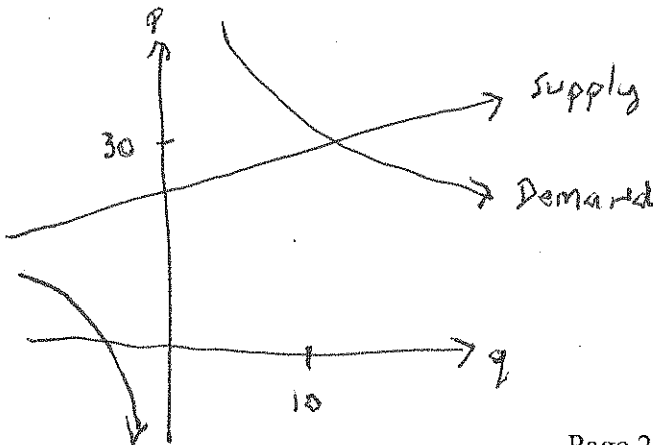
market equilibrium is reached when 100 units are sold for $3000 each.

$[-10, 20] \times [-10, 40]$