Exercise: Supply and Demand
An economist uses as a model for the demand of a product:

$$Q_d = -0.5p + 80$$

where Q_d is the quantity **demanded**, in units and p is the price of one unit, in dollars.

The model used for the supply of the same product is:

$$Q_s = 2p - 20$$

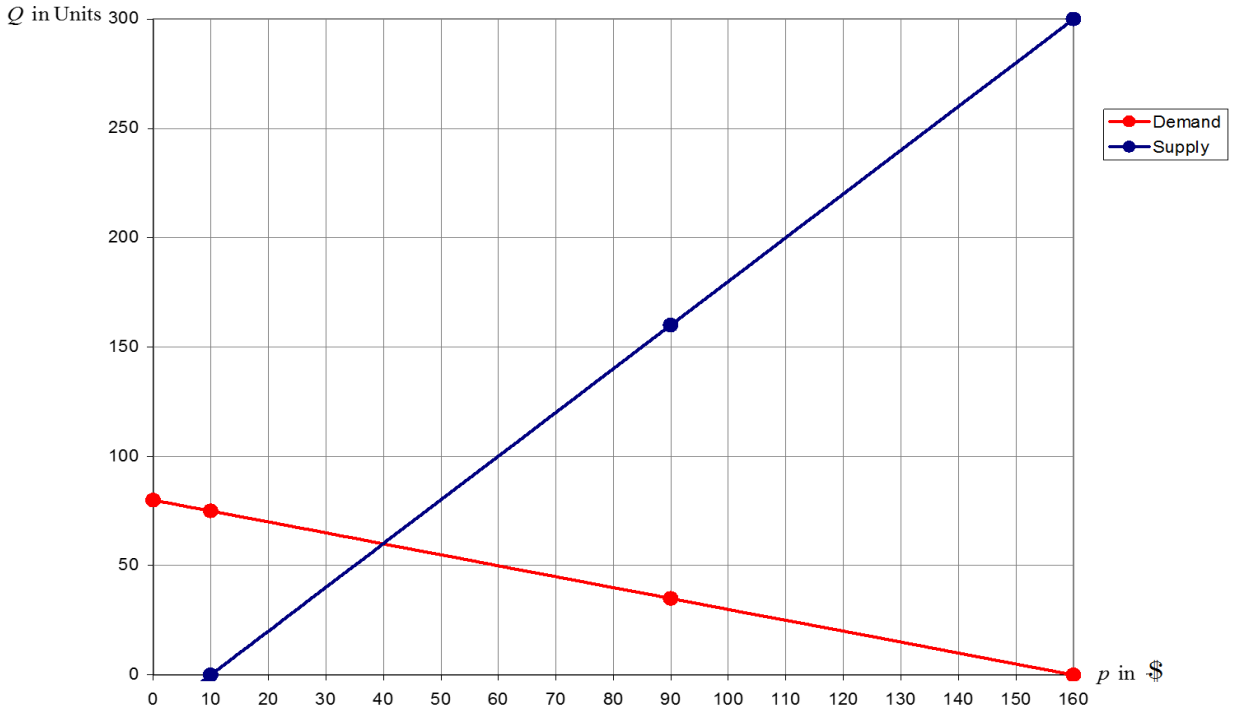
where Q_s is the quantity **supplied**, in units and p is the price of one unit, in dollars.

(a) Draw an accurate graph of both of these equations for p = 10 to p = 160. Use the horizontal axis for p and the vertical axis for Q_d and Q_s. Draw both graphs on the same diagram.

Tables for graphing the equations are:

Demand: $Q_d = -0.5p + 80$

p	10	90	160
Q_d	75	35	0



(b) Use your graph to find the equilibrium price.

The equilibrium price is the value of p at the point where the graphs intersect. If the graphs are drawn accurately on graph paper it is possible to read the equilibrium price accurately.

Equilibrium price = \$40

Notice that the **slope of the demand is negative**, and **the slope of the supply is positive**.

For P < \$40, demand exceeds supply.
For P > \$40, supply exceeds demand.

p	Q_d	Q_s	Shortage (–) or excess (+)
20	70	20	– 50
30	65	40	– 25
40	60	60	0
50	55	80	+ 25
60	50	100	+ 50