Study Questions—Market, 2nd Question

1. A market has demand and supply equations

$Q_d = 1000 – 5P + .1I + P_s$
$Q_s = -200 + 4P$

Income, I, is currently 200
The price of a substitute, P_s, is currently 5

Use the above information to calculate:
a) Equilibrium price and quantity
b) Price elasticity of demand at equilibrium
c) Income elasticity of demand at equilibrium
d) Cross elasticity of demand at equilibrium

1 a) Plug I and Ps values into the demand equation:
$Qd = 1000 - 5P + .1(200) + 5 \rightarrow Qd = 1025 - 5P$

Set $Qd = Qs \rightarrow$ $1025 - 5P = -200 + 4P$
$1225 = 9P$
$136.111 = P$

Plug P into supply curve (or demand curve) to get Q:
$Q = -200 + 4(136.1111) = 344.4444$

b) $dQ/dP \times P/Q = -5 \times (136.1111/344.4444) = -1.9758$ (elastic)

c) $dQ/dI \times I/Q = .1(200/344.444) = .058$ (a normal good)

d) $dQ/dP_s \times P_s/Q = 1 \times (5/344.4444) = .01452$