Exp If the supply and Demand functions for a commodity are given by

Supply: $p - q = 10 \Rightarrow p = q + 10$

Demand: $q(2p - 10) = 2100$

① What is the Eq. quantity and Eq. price

Supply = Demand

$q + 10 = \frac{1050}{q} + 5$

$-5 \qquad -5$

$q + 5 = \frac{1050}{q}$ multiply by q

$q^2 + 5q = 1050$

$-1050 \qquad -1050$

$q^2 + 5q - 1050 = 0$

1050

$\frac{q(2p-10)}{q} = \frac{2100}{q}$

$2p - 10 = \frac{2100}{q}$

$+10 \qquad +10$

$\frac{2p}{2} = \frac{2100}{q_2} + \frac{10}{2}$

$p = \frac{1050}{q} + 5$ Demand

$D = \sqrt{b^2 - 4ac} = \sqrt{(5)^2 - 4(1)(-1050)}$

$= \sqrt{25 + 4200}$

$= \sqrt{4225}$

$a=1,\ b=5,\ c=-1050$

$= \sqrt{4225}$

$= 65$

$$q = \frac{-b \pm \sqrt{D}}{2a} = \frac{-(5) \pm 65}{2(1)} = \frac{-5 \pm 65}{2}$$

$$q_1 = \frac{-5+65}{2} = \frac{60}{2} = 30$$ مقبول

$\Rightarrow q_1^* = 30$ Eq. quantity

$$q_2 = \frac{-5-65}{2} = \frac{-70}{2} = -35$$

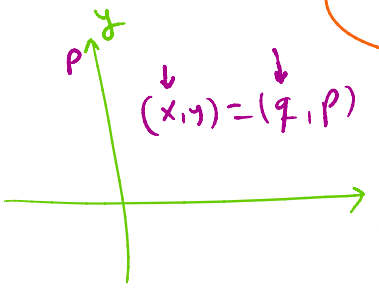
$p^* = q^* + 10$

$= 30 + 10$

$p^* = 40$ Eq. Price

Market Equilibrium is

$(q^*, p^*) = (30, 40)$



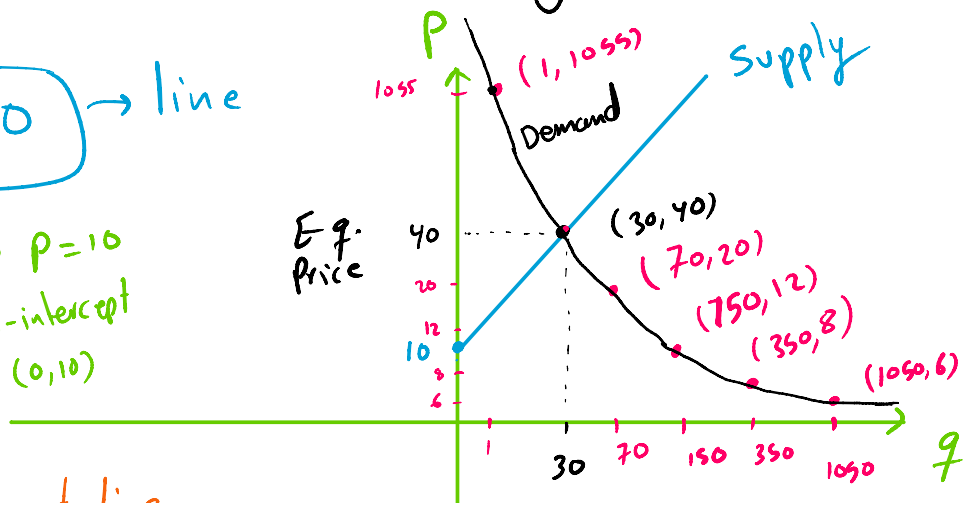
(2) Draw the demand and supply functions

Supply : $p = q + 10$ → line

when $q=0 \Rightarrow p=10$

y-intercept

(0,10)



Demand :

Demand :

$$P = \frac{1050}{q} + 5$$

→ not line

q	1	30	70	150	350	1050
P	1055	40	20	12	8	6