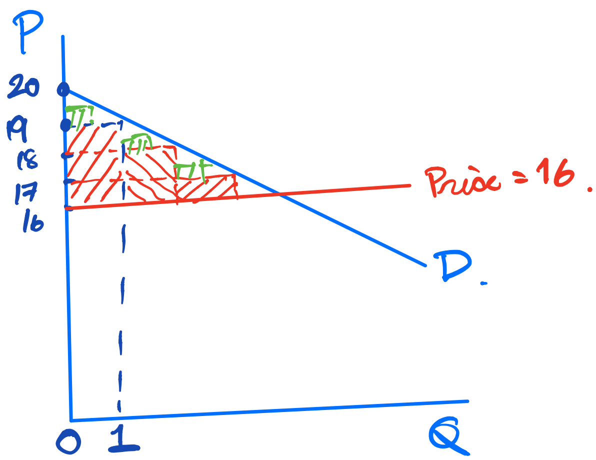
Consumer's Surplus

= Value of the quantity bought in the mind of the consumer(s) subtracted by the total amount paid.



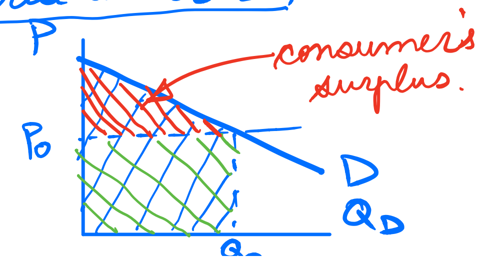
P	Q_D	
20	0	
19	1	→ Consumer values the 1st unit ⇒ 19
18	2	→ " 2 → ≥ 18
17	3	→ " 3 → ≥ 17
16	4	→ " 4 → ≥ 16.

If $P = 16$ for all units, pays $16 \times 4 = 64$ ฿

but receives total value $\geq 19+18+17+16 = 70$ ฿.

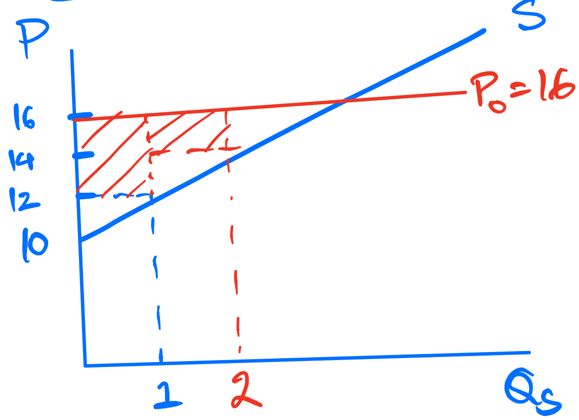
$\therefore$ Consumer's surplus $= 70 - 64 = 6$ ฿

If we can vary the price at any decimal point, the consumer's surplus will be the area under D, subtracted by the amount paid ($= P_0 \cdot Q_0$)



Note P_0 reflects the value the buyer places on the last unit bought.

Producer's Surplus.



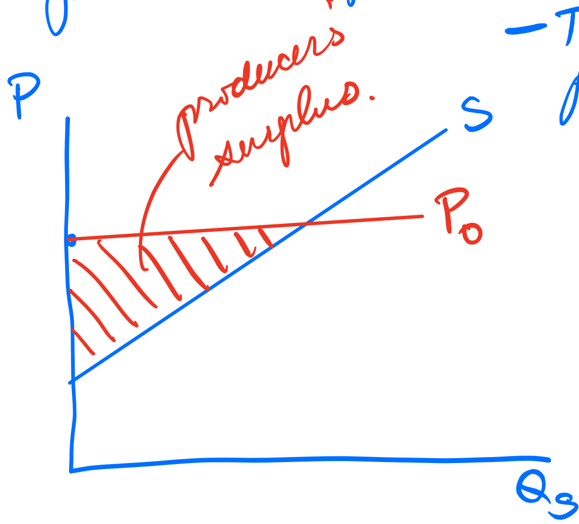
P	Qs	
10	0	
12	1	Cost of 1^{st} unit ≤ 12.
14	2	—— 2^{nd} —— ≤ 14
16	3	—— 3^{rd} —— ≤ 16.

$P_0 = 16$, Total revenue $= 3 \times 16 = 48$

Total cost $= 16 + 14 + 12 = 42$

$\therefore$ Producer's Surplus $= 48 - 42$
$= 6$ ~~B~~

If we can vary the price continuously, the producer's surplus = Total Revenue
− Total Additional costs of producing each additional unit.

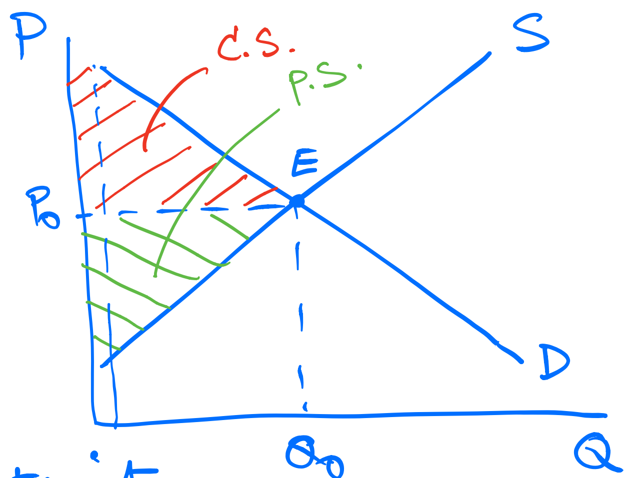


Note: P_0 is the cost of producing the last unit sold.

Market Equilibrium. $E=(Q_0, P_0)$

① Excess D = Excess S = 0

$$\underbrace{Q_D = Q_S}_{\text{Eq. Condition.}}$$



② P_0 = value the buyer places on the last unit
= cost of producing the last unit.

③ Social Welfare = C.S + P.S.
= Total welfare gained from having Q_0 at price P_0

Note at $E=(Q_0, P_0)$ is where social welfare is maximized. i.e. if the price is not P_0 and quantity is not Q_0, the society will receive less social welfare (to be seen in the following Applications)