Supply and Demand

Demand: how much consumers will buy at a particular price; describes consumers' willingness to pay (WTP). $\boxed{Q_d = a - b \cdot P}$

Supply: how much producers will provide at a particular price; describes producers' willingness to accept (WTA) / the industry's aggregate marginal cost curve (i.e. Market supply is the <u>sum</u> of the individual firm supply curves). $\boxed{Q_s = c + d \cdot P}$

Remember to always check whether we need to invert a given function! **Competitive Markets**: Individual firms and consumers don't affect prices (i.e. they have no market power and are price takers) **Competitive Market Equilibrium**:

$\boxed{Q^* = Q_s(P^*) = Q_d(P^*)}$ In these markets, prices are determined by:

- the **"marginal buyer"** $P^* = WTP$: who would leave the market if the price were any higher, and
- the **"marginal seller"** $P^* = WTA$: who would leave the market if the price were any lower

Producer Surplus (PS): = Revenue - Total WTA = Revenue - Total Variable Cost (area below price and above supply.)

Without market power, firm-level inverse demand curve is perfectly elastic (i.e. horizontal) at the market price. Market sets $\boxed{MR(Q) = P}$. Firm's supply curve is its MC curve. Firm profit **maximized** when:

$\boxed{\text{Market } P = MR(Q^*) = MC(Q^*)}$, provided the firm is operating at all. *Not to be confused with the MR discussed in H1 Monopoly Pricing!*

First Welfare Theorem: Competitive markets are **efficient** (i.e. they maximize total surplus = CS + PS).

- Assumes no distortions such as market power, info frictions, or *externalities*.
- Under perfect competition, all trades involving consumers who value the good more than the marginal cost associated with producing an additional unit of the good are realized.

Welfare is maximized: by the perfectly competitive outcome when there are not externalities. To maximize total welfare, we want

- Consumers get: $CS = \frac{1}{2}(a - P^*)Q^*$
- Producers get: $PS = \frac{1}{2}(P^* - c)Q^*$
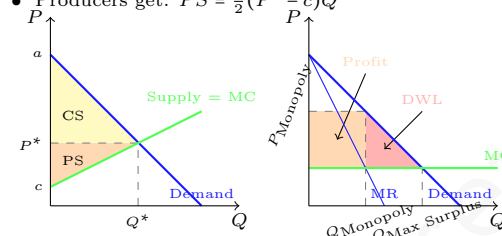
Competitive markets maximize total surplus.

Distortion e.g.: Pricing with market power

Deadweight Loss (DWL): Lost surplus due to a distortion away from perfect competition.

$\boxed{DWL = CS + PS - TS}$ i.e. Maximum surplus - Achieved surplus. DWL offers an opportunity to "grow the pie", represents the value proposition for many firms.

In the left graph: DWL will be generated

- if $Q < Q^*$ because there will be consumers that value the product at above the marginal cost
- if $Q > Q^*$ because there will be consumers consuming the product even though their $WTP < MC$

Cost Shock: if one side of the market is highly elastic, then they can avoid shocks (and pass on any taxes / transation fees).