p: price of a good

q: quantity demanded of a good

Demand function: $q = q^D(p)$

Inverse demand function: $p = q^{D^{-1}}(q)$

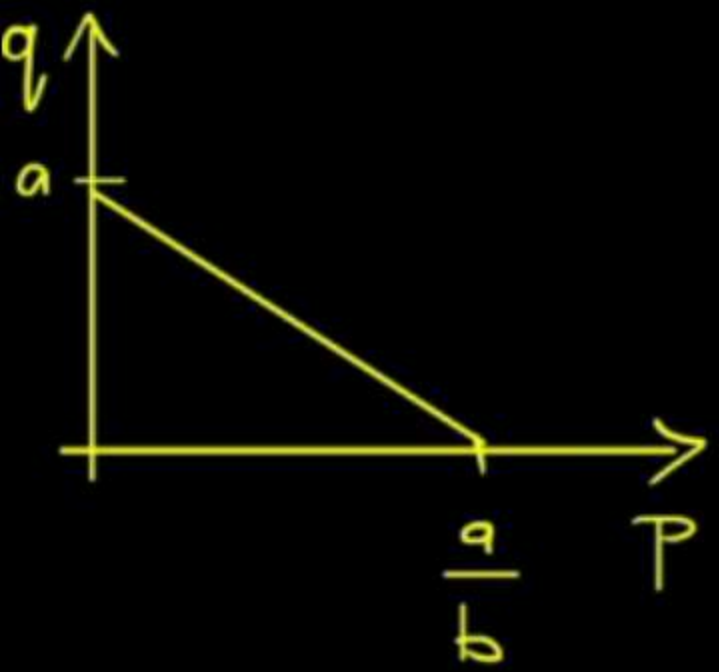
Example: linear demand function

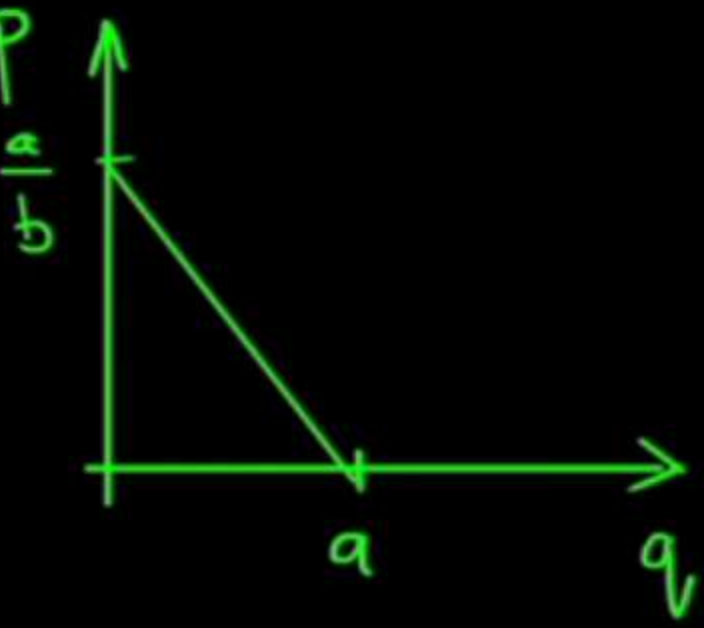
$$q = a - bp \quad , \quad a > 0, b > 0$$

$$q = a - bp$$

$$bp = a - q$$

$$p = \frac{a-q}{b} = \frac{a}{b} - \frac{1}{b}q$$





Demand functions for alcohol

$$q_b(p_b) = 92p_b^{-0.36}$$
$$q_w(p_w) = 90p_w^{-0.70}$$
$$q_s(p_s) = 31p_s^{-0.68}$$

$q_b(5) = 92 \times 5^{-0.36} \approx 52$

$q_b(10) = 92 \times 10^{-0.36} \approx 40$

Source: Gallet, C. (2007) "The demand for alcohol: a meta-analysis of elasticities", *The Australian Journal of Agricultural and Resource Economics*

$q_b = 92 p_b^{-0.36}$

$p_b^{-0.36} = \frac{92}{q_b}$

$p_b(q_b) = \left(\frac{92}{q_b}\right)^{-\frac{1}{0.36}}$

$p_b(40) \approx 10, \; p_b(52) \approx 5$

$p_b(31) = \left(\frac{92}{31}\right)^{-\frac{1}{0.36}} \approx \underline{\underline{20}}$