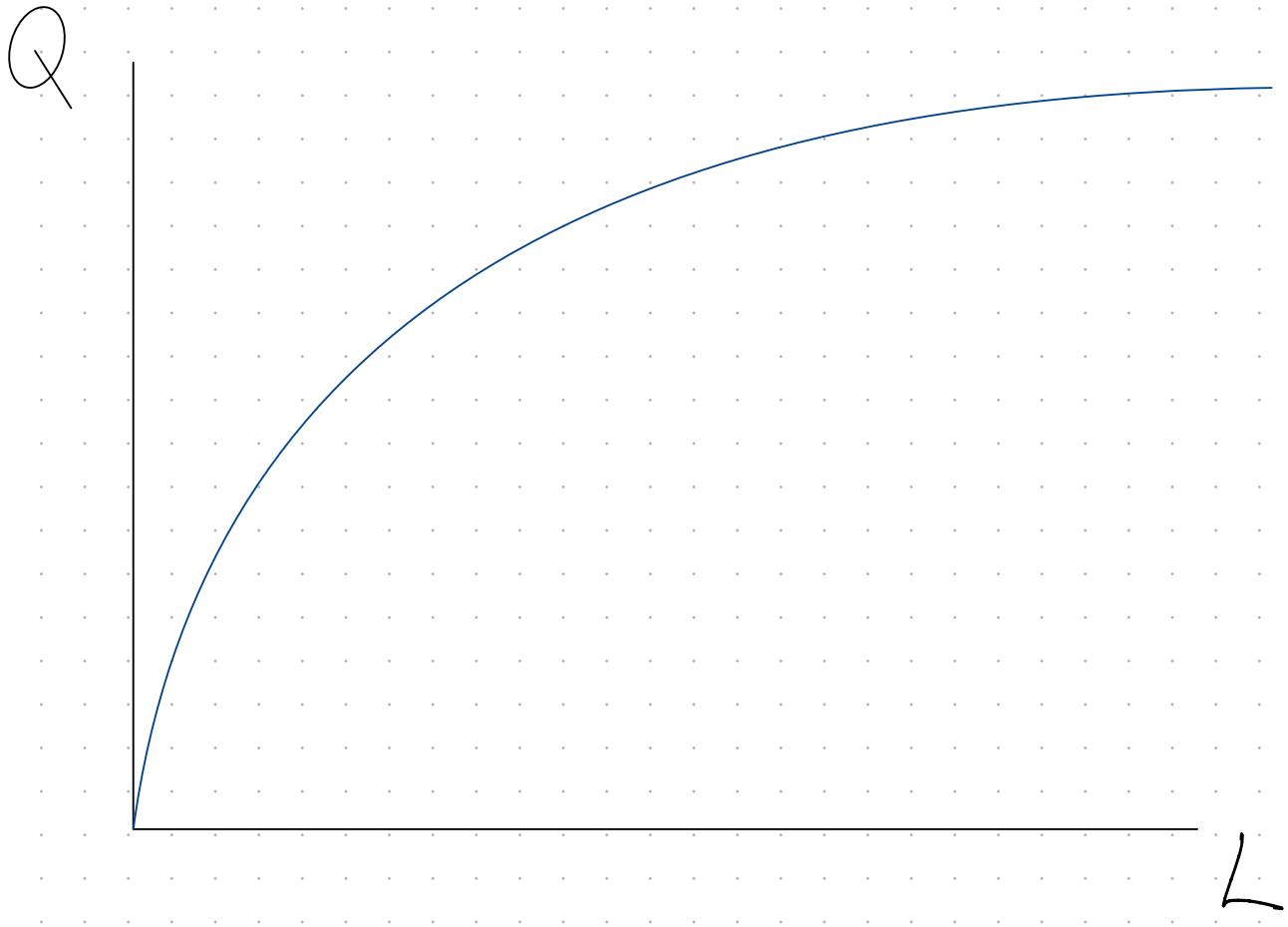
Short Run

This means fixed

$$Q = f(\bar{K}, L) = \bar{K}^{.5} L^{.5}$$

Let's say $\bar{K} = 16$

$$Q = f(\bar{K}, L) = 4L^{.5}$$



$$\frac{dQ}{dL} = MP_L$$

ex: $Q = 4L^{.5}$

$$\frac{dQ}{dL} = .5 \cdot 4 \cdot L^{.5-1} = 2L^{-.5}$$

more inputs → more outputs

is this >0 or <0?

$$2L^{-.5} = \frac{2}{L^{.5}} = \frac{2}{\sqrt{L}}$$

$$\frac{dQ}{dL} = 2L^{-.5}$$

$$\frac{d^2Q}{dL^2} = -.5 \cdot 2 \cdot L^{-.5-1} = -L^{-1.5}$$

is this >0 or <0?

$$-L^{-1.5} = \frac{-1}{L^{1.5}}$$

$$\pi$$

$$< 0 \quad \forall L$$

diminishing marginal returns