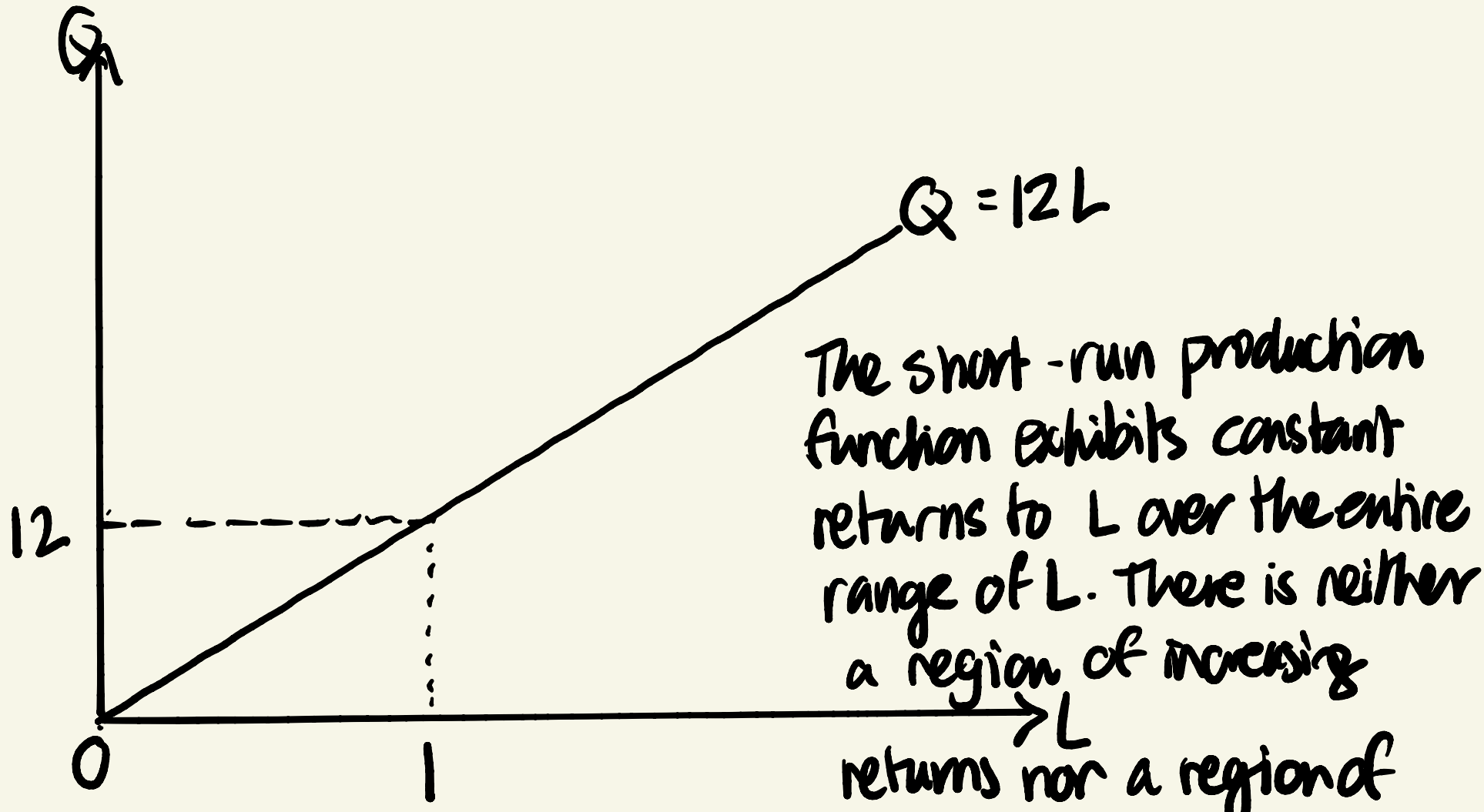
EE211
Class activity on Oct 10, 2023 (Theory of the firms)

Suppose the production function is given by Q=3KL, where K denotes capital and L denotes labor. The price of capital is $2/ machine-hour, the price of labor is $24/ person-hour, and capital is fixed at 4 machine-hour/ hour in the short run. Graph the TC, VC, and FC curves for this production process.

The production function

$Q = 3KL$, with $K = 4$ $\quad Q = 3(4)L = 12L$



The short-run production function exhibits constant returns to L over the entire range of L. There is neither a region of increasing returns nor a region of deminishing returns to L.

$$Q = 3KL$$

$$Q = 3(4)L$$

$$Q = 12L$$

$$L = \frac{Q}{12}$$

The total cost of producing Q units of output per hour is therefore given by

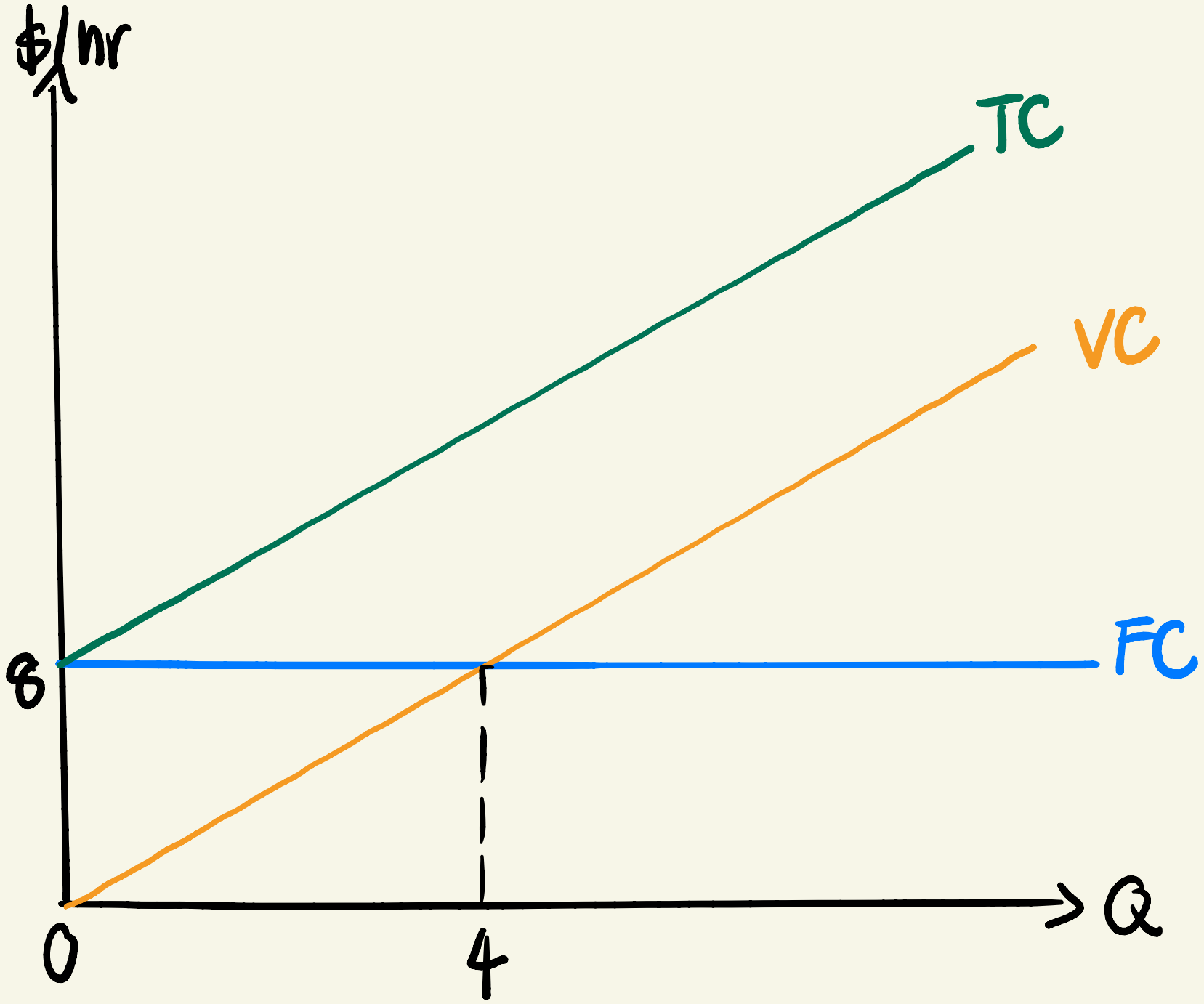
$$TC(Q) = (\$2/\text{machine-hr})(4 \text{ machine-hr/hr}) + (\$24/\text{person-hr})\left(\frac{Q}{12} \text{ person-hr/hr}\right) = \$8/\text{hr} + \$2Q/\text{hr}$$

The $8/hr expenditure on capital constitutes fixed cost.

Variable cost is total cost less fixed cost, or

$$VC = 2Q$$

The total, variable, and fixed cost curves are plotted.


$/hr
TC
VC
FC
8
0
4
Q