

- Given the following cost schedule, fill in the rest of the chart. In the first blank row, give the mathematical definitions for the column headings FC, VC(q), AC(q), AVC(q), and MC(q). In the subsequent rows, solve for their values. Then on one clearly labeled graph, plot FC, C(q), and VC(q). On another clearly labeled graph, plot AC(q), AVC(q), and MC(q). Make sure your diagrams are completely consistent with all you know about these curves.

Q	C(q)	FC	VC(q)	AC(q)	AVC(q)	MC(q)
Define → mathematically						
0	4					
1	12					
2	18					
3	22					
4	25					
5	27					
6	35					
7	51					

- The upward sloping portion of the MC(q) curve for one firm lies on the line $P = 0.5q + 0.5$, crosses the firm's AVC(q) curve at $q = 1$, and crosses the firm's AC(q) curve at $q = 3$. Draw one graph consistent with all this information. [Hint: the graph should include a plot of $P = 0.5q + 0.5$ and sketches of relevant portions of the firm's AVC(q) and AC(q) curves.]

On a second graph, plot the short run supply curve for an industry composed of 10 such firms. On this second graph, also plot the demand for that industry's product, which is $P = -Q + 80$, and identify the equilibrium quantity and price.

Given this short run equilibrium price (the one you just identified above) and the cost information above (in the first paragraph of this question), what will happen to this industry in the long run? [Hint: your answer should include a discussion of short and long term profits, entry and exit, and equilibrium price and quantity adjustment.]

- In a "dirty" industry, a byproduct of production is pollution. The industry's supply curve is $P = 5Q + 5$ before regulation. Demand for the industry's product is $P = -Q + 80$. Based on a scientific determination that each unit of this industry's output causes \$1.50 in environmental damage, the government decides to impose a specific tax of $t = \$1.50$ on each unit of output. Draw a graph that includes the industry's pre- and post- regulation supply curve, the demand curve they face, and pre- and post- regulation equilibrium prices and quantities. Also solve for these pre- and post- regulation equilibrium prices and quantities. Also indicate (on your graph and mathematically) the tax revenue and consumer and producer incidence of the tax.