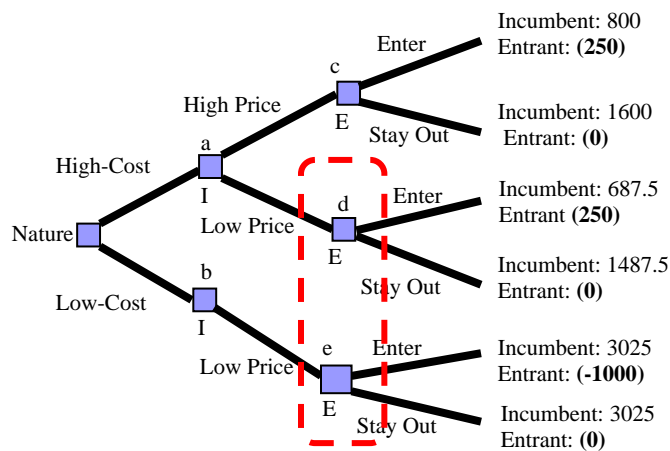


An incumbent firm operates in a local computer market, which is a natural monopoly. That is, there is room for only one firm to sell profitably in this market. Market demand for the good is estimated to be $P = 120 - 2Q^D$. Another firm would like to enter this market, but only if the incumbent firm has a higher unit cost than it does. Specifically, there is a p percent chance that the incumbent is a low-cost firm with a unit cost equal to 10, and there is a $(1 - p)$ percent chance that the incumbent is a high-cost firm with a unit cost of 40. The entrant's unit cost is 20. The entrant knows its costs but not that of the incumbent. The incumbent does know its unit cost. Market demand is common knowledge to both firms. The entrant, however, does get to observe the current or pre-entry market price at which the incumbent sells its good. If the entrant decides to enter the market it incurs a setup cost of \$1,000.

- a. Rachelle draws the extensive form for the game as follows. However, she totally forgets to calculate the profits for the entrant. Please fill in the blanks in the extensive form with the entrant's profits.



An example about how to calculate the entrant's profit

(High Price, Enter): In Period 2, only the entrant is in the market (as a monopolist). The profit-maximizing output level satisfies:

$$MC=MR \rightarrow 20=120-4Q \rightarrow Q=25, \text{ and } P=70.$$

$$Profit=P*Q-AC*Q-FC=70*25-20*25-1000=250.$$

- b. Besides missing payoffs for the entrant, what else is wrong with the extensive form drawn by Rachelle?

When the entrant observes low price, she does not know if she is at node d or node e – there is imperfect information.

- c. The probability p should satisfy what condition so that the high-cost firm has an incentive to set a low price in order to masquerade as a low-cost firm?

$$P*(-1000) + (1-p)*250 < 0$$

$$p > 0.2.$$