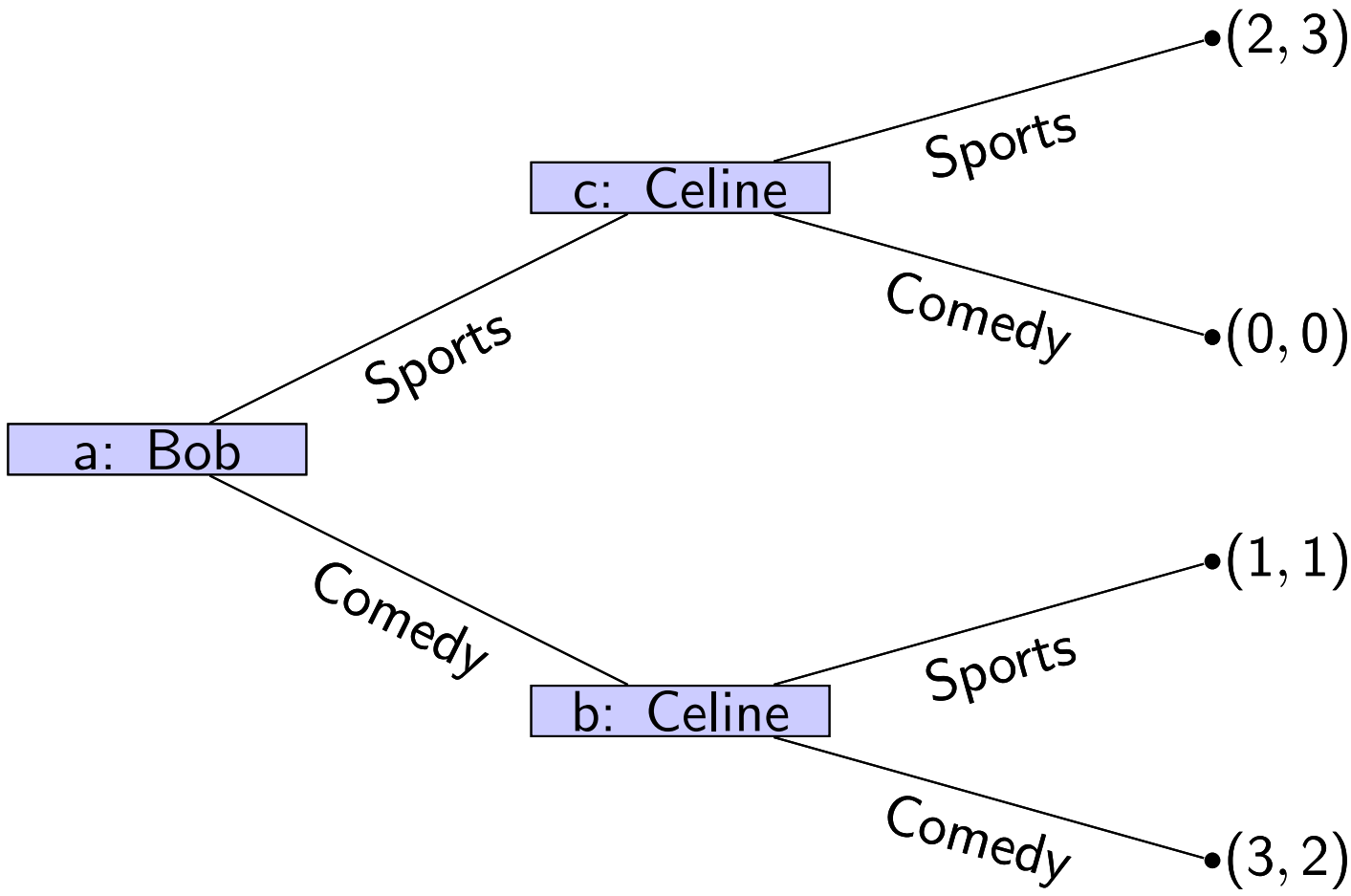
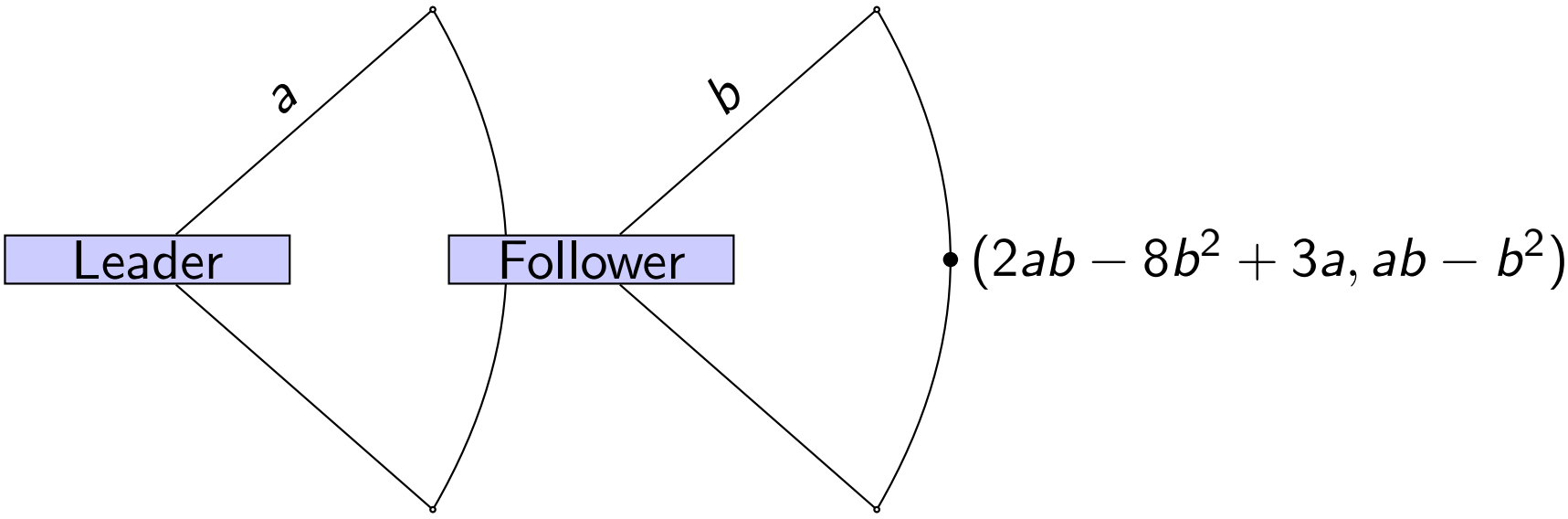
Extensive Form Games

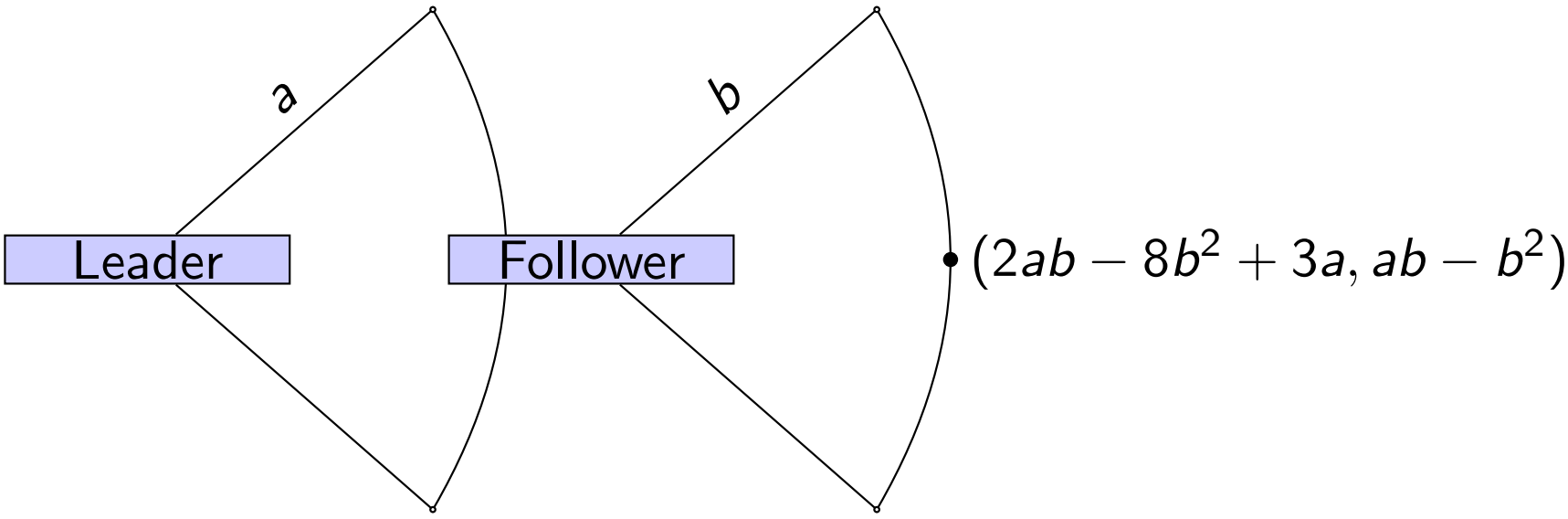
Game Theory

Vincent Knight

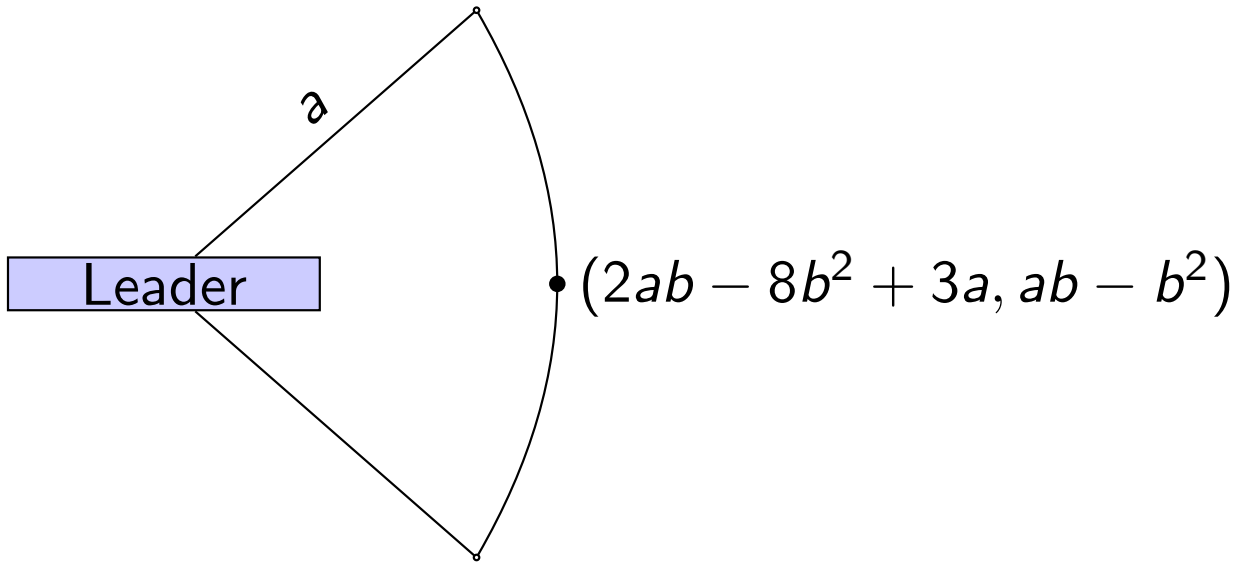

a: Bob
Sports
Comedy
c: Celine
Sports
Comedy
(2, 3)
(0, 0)
b: Celine
Sports
Comedy
(1, 1)
(3, 2)

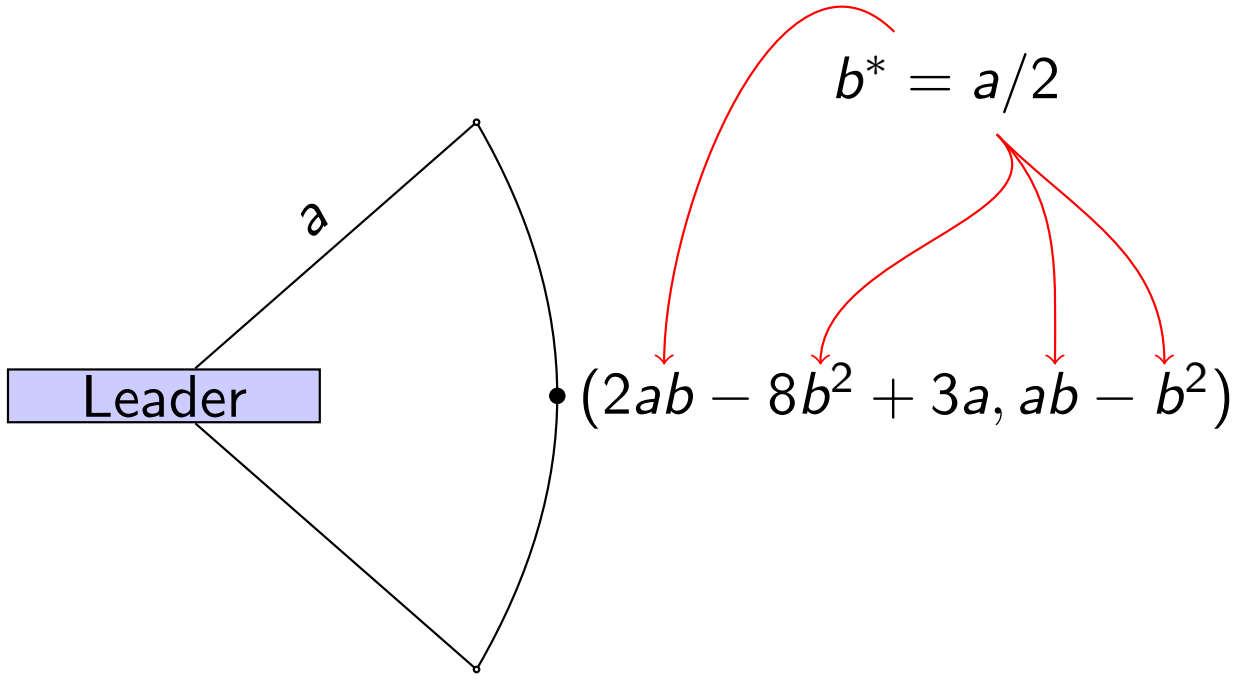
- **Sequential rationality:** An optimal strategy for a player should maximise that player's expected payoff, conditional on every information set at which that player has a decision.
- **Backward induction:** This is the process of analysing a game from back to front. At each information set we remove strategies that are dominated.

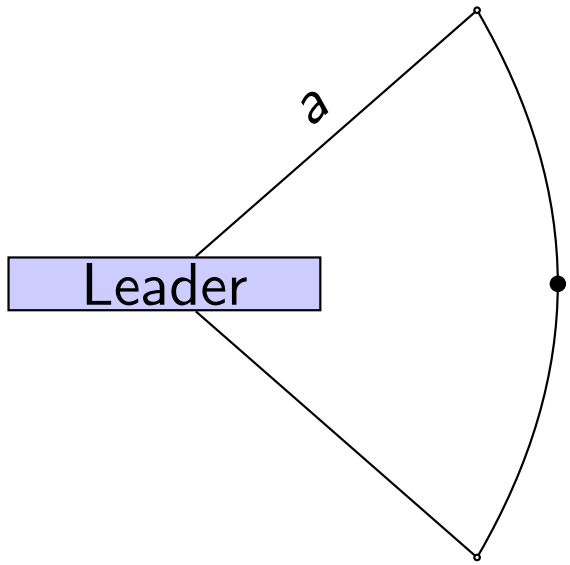

a
b
Leader
Follower
$(2ab - 8b^2 + 3a, ab - b^2)$



$$\frac{d}{db}(ab - b^2) = 0 \Rightarrow b^* = \frac{a}{2}$$

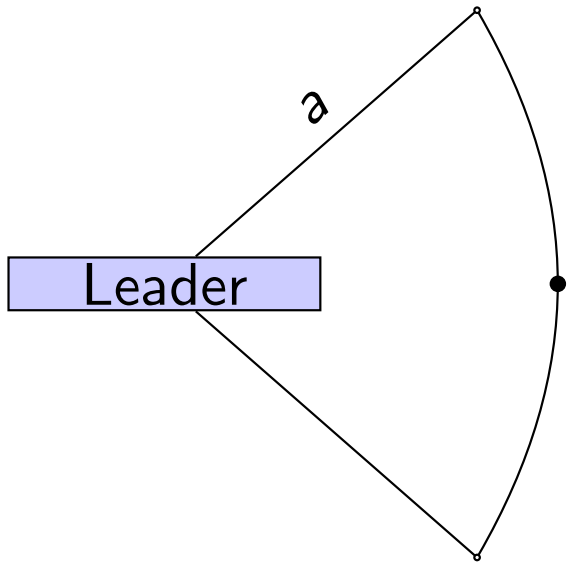

a
Leader
$(2ab - 8b^2 + 3a, ab - b^2)$


$b^* = a/2$
a
Leader
$(2ab - 8b^2 + 3a, ab - b^2)$



$(a^2 - 2a^2 + 3a, a^2/2 - a^2/4)$

$$\frac{d}{da}(-a^2 + 3a) = 0 \Rightarrow a^* = \frac{2}{3}$$



$(a^2 - 2a^2 + 3a, a^2/2 - a^2/4)$

$$\frac{d}{da}(-a^2 + 3a) = 0 \Rightarrow a^* = \frac{2}{3}$$

$$\boxed{(a^*, b^*) = (2/3, 2/6)}$$