If the sum of the data rates $x_A(t) + x_B(t)$ in a round is larger than 10, then

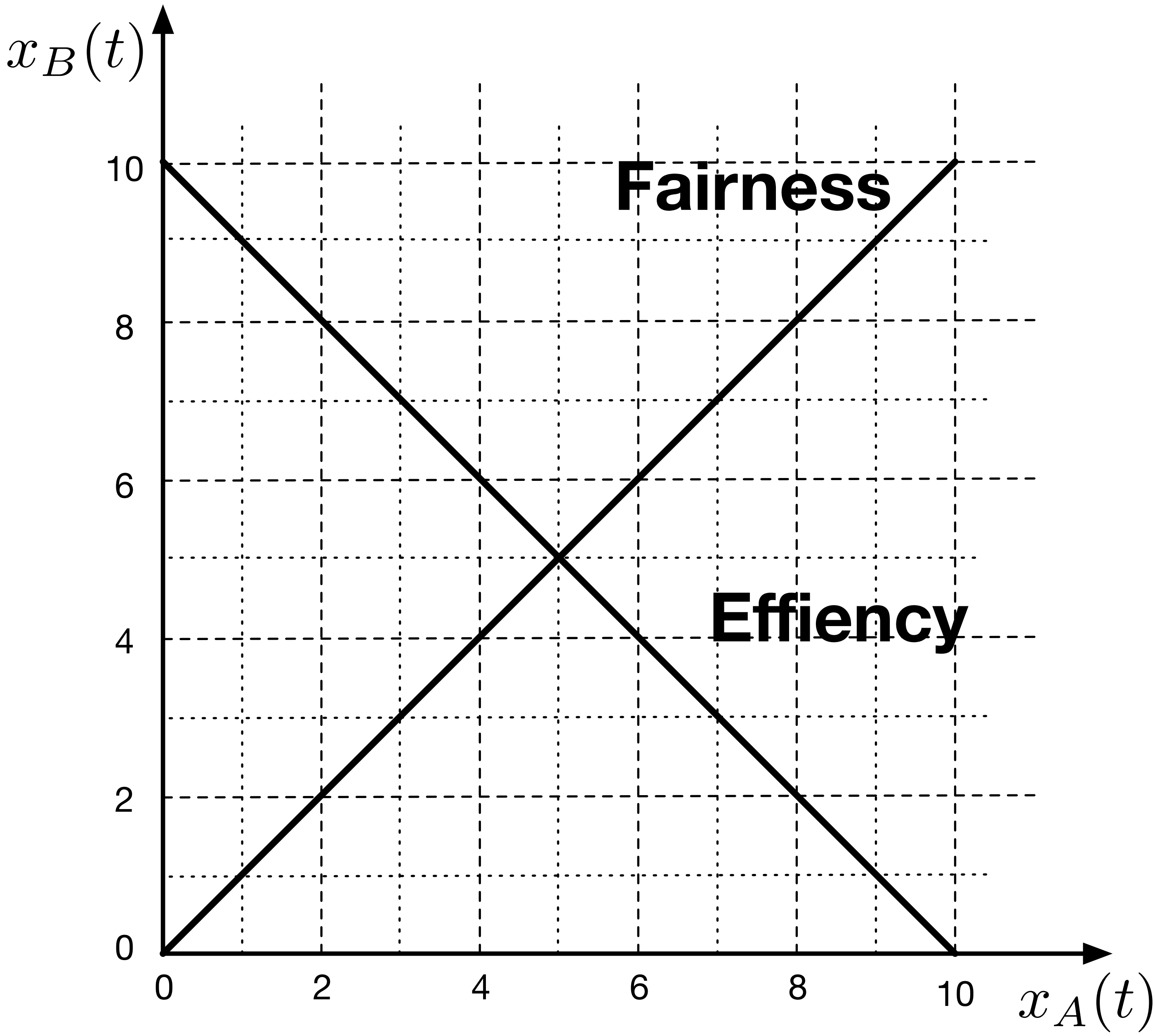
$$\begin{aligned} x_A(t+1) &= \tfrac{1}{2} x_A(t) \\ x_B(t+1) &= \tfrac{1}{2} x_B(t) \end{aligned}$$

Otherwise we have

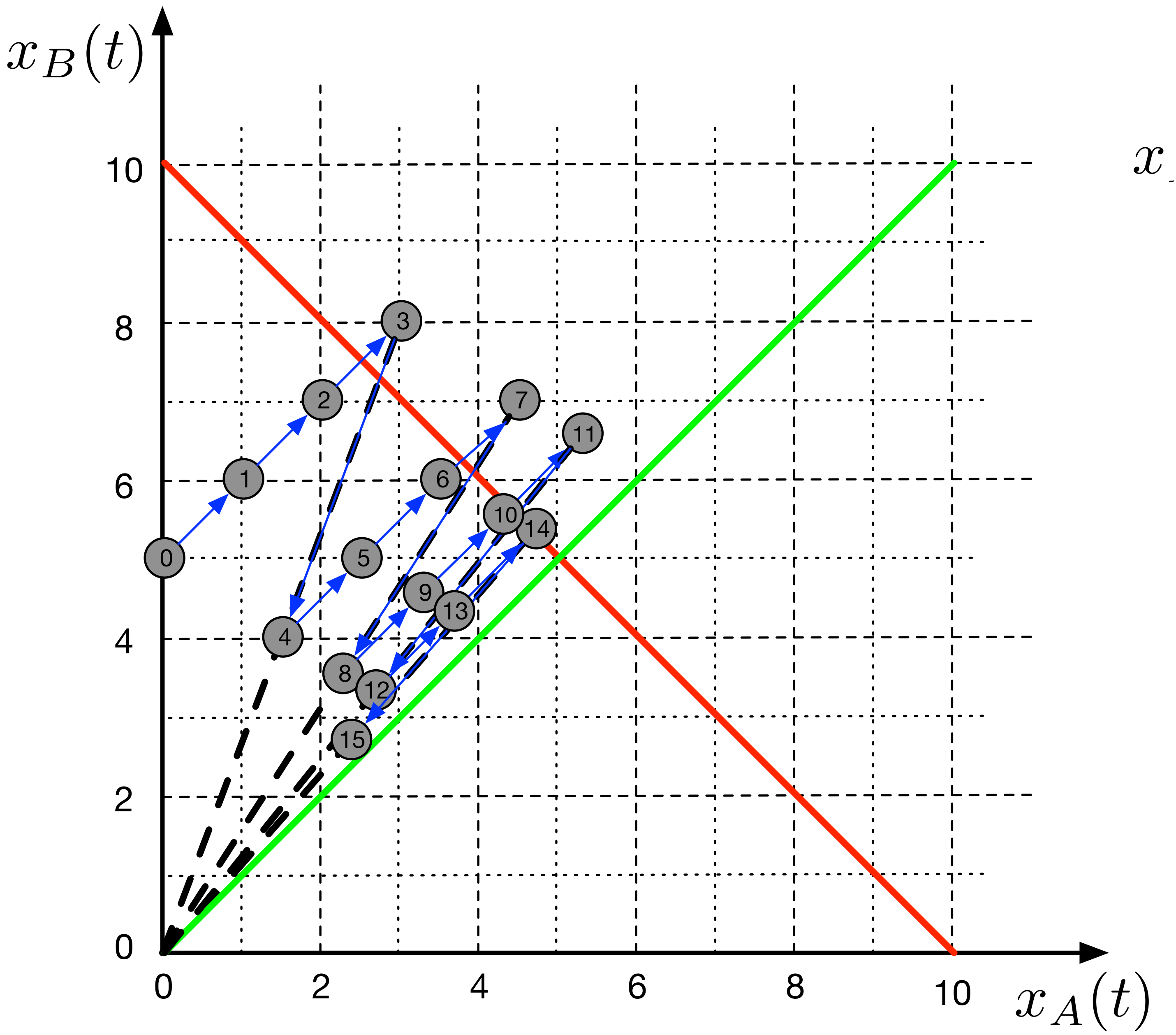
$$\begin{aligned} x_A(t+1) &= x_A(t) + 1 \\ x_B(t+1) &= x_B(t) + 1 \end{aligned}$$

1st task

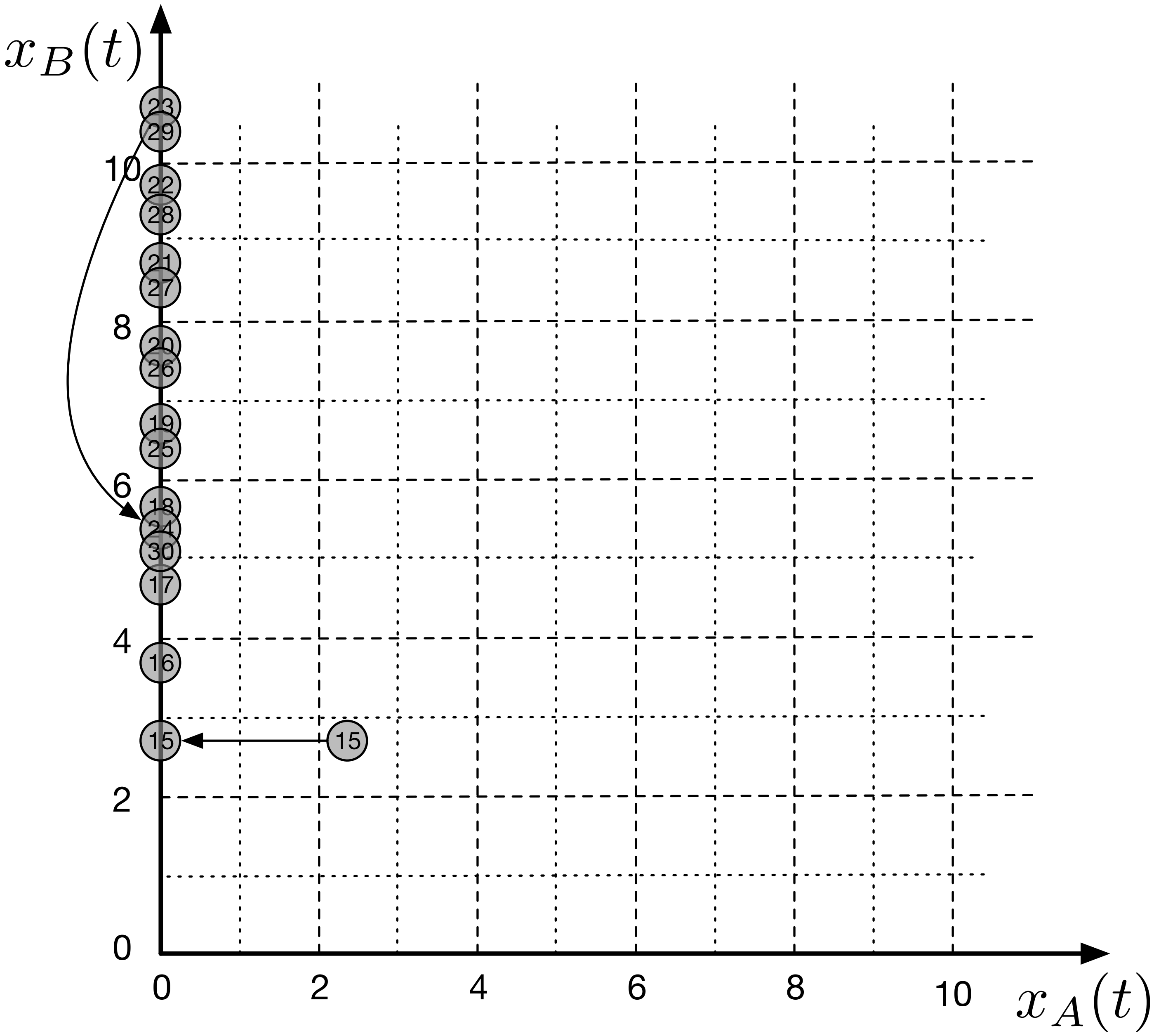
1. Add the fairness and efficiency lines to the diagrams.



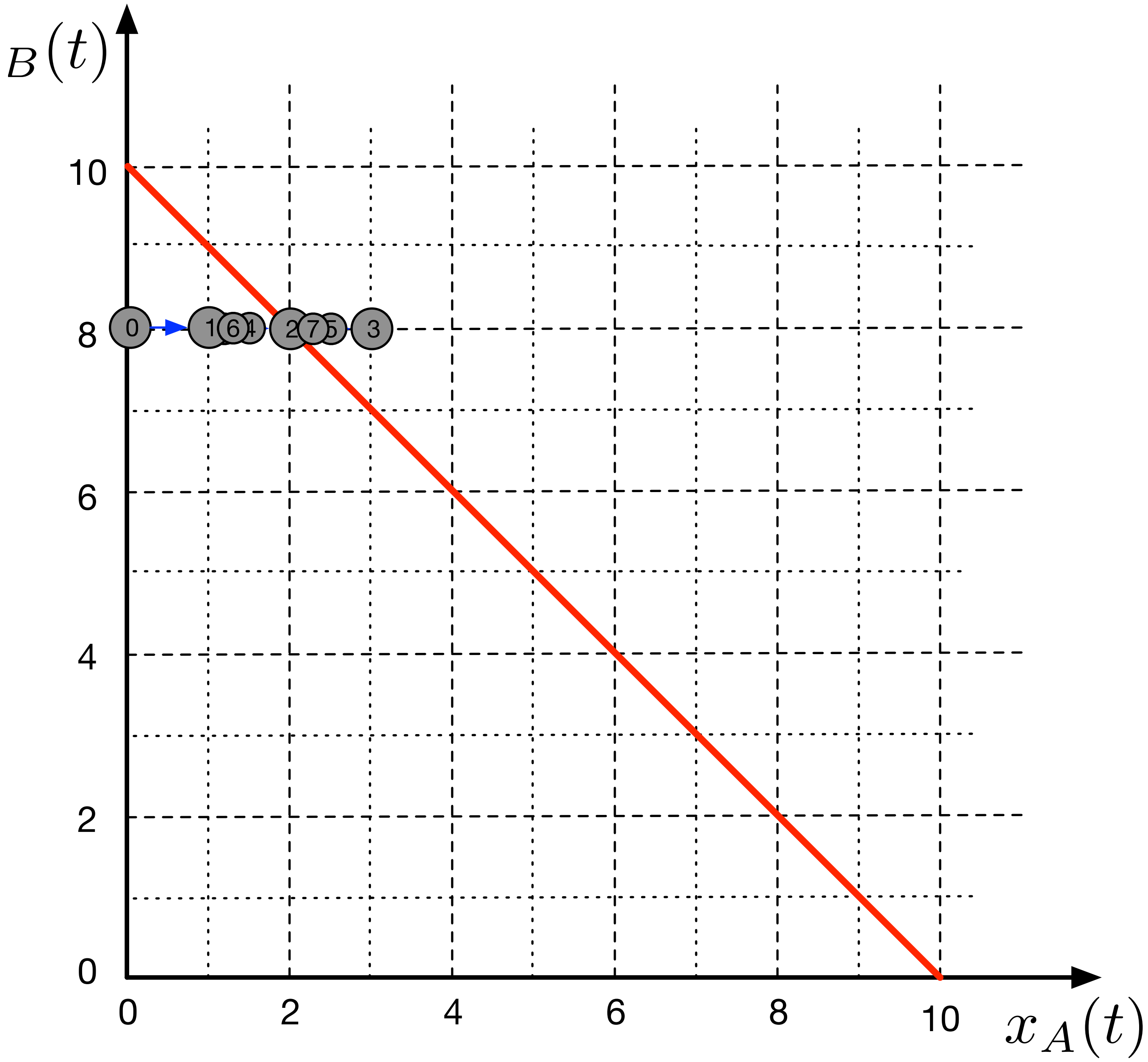
2. Assume A starts in round 0 with $x_A(0) = 0$ and B at round 5, i.e. $x(B)(t) = 0$ for all $t \leq 5$. Compute the first 15 values of A and B and add the behavior to the diagram above.



3. Now A leaves in round 15, such that $x(A)(t) = 0$ for $t \geq 15$. Compute the next 10 rounds.



4. In a different scenario assume that A uses AIMD, but B hast constant data rate 8, i.e. $x_B(t) = 8$. What happens?



In the last scenario assume that A changes its behavior to AIAD (additive increase/additive decrease), i.e. replacing $x_A(t+1) = \frac{1}{2}x_A(t)$ by $x_A(t+1) = x_A(t) - 1$. Simulate 15 rounds where A and B start at the same time with bandwidth 0.