Problème 6 (16 points)

a)

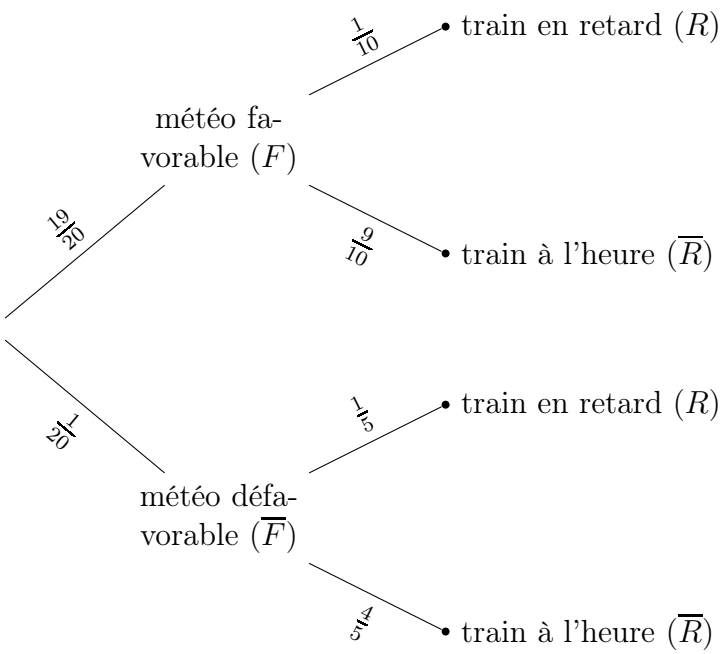
1) $\overline{A}_5^2 = 2^5 =$ 32 trains

2) $C_1^2 \cdot C_1^4 = 2 \cdot 4 =$ 8 trains

3) aucun wagon de première classe : $C_1^2 \cdot 1 = 2 \quad \Rightarrow \quad 32 - 2 =$ 30 trains

b)

1)



2) $P(\overline{R}) = \dfrac{19}{20} \cdot \dfrac{9}{10} + \dfrac{1}{20} \cdot \dfrac{4}{5} = \dfrac{171}{200} + \dfrac{1}{25} = \dfrac{179}{200} =$ 89.5 %

3) $P(\overline{F}|R) = \dfrac{P(\overline{F} \cap R)}{P(R)} = \dfrac{\frac{1}{20} \cdot \frac{1}{5}}{1 - \frac{179}{200}} = \dfrac{\frac{1}{100}}{\frac{21}{200}} = \dfrac{2}{21} \simeq$ 9.52 %

4) aucun train en retard : $0.895^8 \simeq 41.17\%$

exactement 1 train en retard : $C_1^8 \cdot 0.105 \cdot 0.895^7 \simeq 38.64\,\%$

$\Rightarrow \quad 41.17\,\% + 38.64\,\% \simeq$ 79.81 %