

Combinatoire

Exercice 1.

$$P_{10}(3; 2) = \frac{10!}{3! \cdot 2!} = \boxed{302\ 400}$$

$$P_9(2; 3; 2) = \frac{9!}{2! \cdot 3! \cdot 2!} = \boxed{15\ 120}$$

Exercice 2.

a) $\bar{A}_{10}^2 = 2^{10} = \boxed{1\ 024}$

$\bar{A}_{12}^2 = 2^{12} = \boxed{4\ 096}$

b) 6 questions justes : $C_6^{10} = 210$

8 questions justes : $C_8^{12} = 495$

7 questions justes : $C_7^{10} = 120$

9 questions justes : $C_9^{12} = 220$

8 questions justes : $C_8^{10} = 45$

10 questions justes : $C_{10}^{12} = 66$

9 questions justes : $C_9^{10} = 10$

11 questions justes : $C_{11}^{12} = 12$

10 questions justes : $C_{10}^{10} = 1$

12 questions justes : $C_{12}^{12} = 1$

$\Rightarrow \boxed{386}$

$\Rightarrow \boxed{794}$

Exercice 3.

a) $A_4^9 = \boxed{3\ 024}$

$A_3^9 = \boxed{504}$

b) $C_2^6 \cdot A_4^9 = \boxed{45\ 360}$

$C_2^5 \cdot A_3^9 = \boxed{5\ 040}$

Exercice 4.

$P_4 \cdot P_2 = \boxed{48}$

$P_5 \cdot P_2 = \boxed{240}$