

Exercice 025

X	0	2	4
P _i	$\frac{21}{32}$	$\frac{6}{32}$	$\frac{5}{32}$

1) La Fonction de répartition.

$$F(x) = P(X \leq x)$$

$$* \text{ Si } x < 0 \rightarrow F(x) = 0$$

$$* \text{ Si } 0 \leq x < 2 \rightarrow F(x) = P(X=0) = \frac{21}{32}$$

$$* \text{ Si } 2 \leq x < 4 \rightarrow F(x) = P(X=0) + P(X=2) \\ = \frac{21}{32} + \frac{6}{32} = \frac{27}{32}$$

$$* \text{ Si } 4 \leq x \rightarrow F(x) = P(X=0) + P(X=2) \\ + P(X=4)$$

$$= 1$$

$$2) E(X) = \sum_{i=0,4} x_i p_i = 0 \times \frac{21}{32} + 2 \times \frac{6}{32}$$

$$+ 4 \times \frac{5}{32} \\ = \frac{12}{32} + \frac{20}{32} = \frac{32}{32} = \boxed{1}$$

$$* \text{ Var}(X) = E(X^2) - E(X)^2$$

$$E(X^2) = \sum_{i=0,4} x_i^2 \times p_i = 0 \times \frac{21}{32} + 4 \times \frac{6}{32} \\ + 16 \times \frac{5}{32} = \frac{24}{32} + \frac{80}{32}$$

$$\boxed{104}$$