The random variable X has probability function

$$P(X = x) = \begin{cases} kx, & x = 1,2 \\ k(x + 1), & x = 3,4 \end{cases}$$

a) Find the value of **k**
b) Work out $P(X \geq 2)$

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a) Work out the probabilities in terms of **k**

$$P(X = 1) = k$$

$$P(X = 2) = 2k$$

$$P(X = 3) = 4k$$

$$P(X = 4) = 5k$$

We know that the sum of all probabilities = 1

$$k + 2k + 4k + 5k = 1$$

$$12k = 1$$

$$k = \frac{1}{12}$$

b)

$$P(X \geq 2) = 1 - P(X = 1)$$

$$P(X \geq 2) = 1 - \frac{1}{12}$$

$$P(X \geq 2) = \frac{11}{12}$$