

Examples

① Suppose an average salary is 82000 and also suppose that the standard deviation of the salaries is 5000.

Find the probability a randomly chosen person's salary is more than 15000 away from the mean.

$$P(|X - 82000| \geq 15000) = P(X \geq 97000 \text{ or } X \leq 67000) \leq \frac{1}{3^2} = \frac{1}{9}$$

\uparrow
(k)(σ_x)
(3)(5000)

\uparrow
by Chebyshev's
Inequality

② Suppose people get, on average, 5.2 pieces of mail in a given day. Also suppose that the standard deviation of the amount of mail received by a person is 2.

$$P(|X - 5.2| \leq 4) = P(1.2 \leq X \leq 9.2) \geq 1 - \frac{1}{2^2} = \frac{3}{4}$$

\uparrow
(k)(σ_x)
(2)(2)

\uparrow
by Chebyshev's
Inequality