1. (1) $f(x) = \sum_{x=0}^{10} (x; 10, \frac{1}{10})$

import scipy.stats as st
prob = st.binom.pmf (k=x, n=10, p=0.1)
prob

4. $b(x; n, p) = \binom{n}{x} p^x q^{n-x}$

$p(x; \mu) = \frac{\mu^x}{x!} \cdot e^{-\mu}$

$x=0 \doteq 0.3487$	$x=6 \doteq 0.0001$
$x=1 \doteq 0.3874$	$x=7 \doteq 0$
$x=2 \doteq 0.1937$	$x=8 \doteq 0$
$x=3 \doteq 0.0574$	$x=9 \doteq 0$
$x=4 \doteq 0.0112$	$x=10 \doteq 0$
$x=5 \doteq 0.0015$	

(2) $E[X] = n \times p = 10 \times \frac{1}{10} = 1$

(3) $Std[X] = \sigma^2 = 0.9$

$\sigma = \frac{\sqrt{10}}{10}$

(4) $\sum_{x=10}^{10} (x; 10, \frac{100-x}{100})$

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2. (1) $f_W[W] = P(W; 100) = \frac{e^{-100} \times (100)^W}{W!}$

(2) $E[W] = 100$ $std[W] = \sqrt{100} = 10$

$E[W] + std[W] = 110$

(3) $\sum_{W=80}^{120} P(W; 100)$

(4) $P(W \geq 0)$

(5) 極推其他. 偏差值過高

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3. (1) $1 - st.binom.cdf (k=10, n=100, p=0.05)$

0.0115

(2) $P(x \geq 10 | P=5\%) = P(x \geq 10)$

"$P=5\%$" $\Rightarrow$ "$x \geq 10$" 機率很小

但 "$x \geq 10$" 確實存在

$P \Rightarrow q$ $\sim q \Rightarrow \sim P$

$P \Rightarrow \sim q$ $q \not\Rightarrow \sim P$