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1-a.

$$f(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}$$

1-b

$$p(-1 \le z \le 1) \doteq 0.682$$

st.norm.cdf(1, μ, σ) − st.norm.cdf(−1, μ, σ)

1-c.

$$p(-x \le z \le x) = 95\%, \quad x \doteq 1.9599$$

$$px = (1 - 0.95)/2$$

x = st.norm.ppf(0.95 + px, μ, σ)

x.

1-d

$$f(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}, \quad -\infty < z < \infty$$

$$f(Q) = \frac{1}{\sqrt{2\pi}} e^{-\frac{Q}{2}} |J| + \frac{1}{\sqrt{2\pi}} e^{-\frac{J^2}{2}} |J|$$

$$= \frac{1}{\sqrt{2\pi}} e^{-\frac{Q}{2}} \frac{1}{\sqrt{Q}}.$$

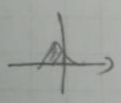
1-e

$$\mu = \alpha * \beta$$

$$\mu = 1.$$

平方 ⇒ 設下 $\sigma^2 \to 2\sigma^1$ 開根號

1-f $\text{std}[Q] = \sqrt{1}$



一半.

1-g $p(Q \le 1) = 0.5$

2-a

$f_X(t) = 1e^{-t}$

2-b. $\mu = 1$

2-c $\sigma = 1$

2-d. $P(T>1) = e^{-1} \doteq 0.37$.

2-e $P(1) = 1,\ \alpha = 3,\ \beta = 1$ $\Gamma(2) = 1!$

$\Gamma(3) = 2!$

$f(t) = \frac{1}{2} t^2 e^{-t}$.

2-f $E[T_3] = 3 \times 1 = 3$

2-g $std[T_3] = \sqrt{3 \cdot 1^2} = \sqrt{3}$

2-h $P(T_3 > 3) = \frac{1}{2} \cdot 9 \cdot e^{-3} \doteq 0.22$

2-i $P(T_3 > 7) = \frac{1}{2} \cdot 7^2 \cdot e^{-7} \doteq 0.0223$

↓

有機會發生，可接受