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## Mathematical Biostatistics Boot Camp: Random Formulae

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This document contains random formulae images I used in the notes.

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$$A = \{1, 2\}$$
  
 $B = \{1, 2, 3\}$ 

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$$E[X^{2}] = \int_{0}^{1} x^{2} dx$$

$$= \frac{x^{3}}{3} \Big|_{0}^{1} = \frac{1}{3}$$
(2)

$$= \frac{x^3}{3} \Big|_0^1 = \frac{1}{3} \tag{2}$$

$$\frac{|x-\mu|}{k\sigma} > 1$$

Over the set  $\{x : |x - \mu| > k\sigma\}$ 

$$\frac{(x-\mu)^2}{k^2\sigma^2} > 1$$

$$\frac{1}{k^2\sigma^2} \int_{-\infty}^{\infty} (x-\mu)^2 f(x) dx$$

$$\frac{1}{k^2\sigma^2} E[(X-\mu)^2] = \frac{1}{k^2\sigma^2} Var(X)$$