

The diagram illustrates the components of the Gaussian distribution formula  $p(x|\mu, \sigma^2) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left\{-\frac{1}{2}(x-\mu)\sigma^{-2}(x-\mu)\right\}$ . The formula is broken down into parts with colored backgrounds and arrows pointing to descriptive labels:

- mean**: Points to  $\mu$  in the parameter list.
- variance**: Points to  $\sigma^2$  in the parameter list.
- normalising constant**: Points to the blue box  $\frac{1}{\sigma\sqrt{2\pi}}$ .
- make sure  $p(x) > 0$** : Points to the purple box  $\exp$ .
- inversely related to  $p(x)$** : Points to the green box  $-\frac{1}{2}$ .
- distance between  $x$  and  $\mu$** : Points to the pink box  $(x-\mu)\sigma^{-2}(x-\mu)$ .

$$p(x|\mu, \sigma^2) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left\{-\frac{1}{2}(x-\mu)\sigma^{-2}(x-\mu)\right\}$$