

## Resources for review

The example in the next part of the lesson assumes you are familiar with Gaussian and binomial distributions.

Here are a few formulas that might be helpful:

### Gaussian distribution formulas

probability density function

$$f(x \mid \mu, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x - \mu)^2}{2\sigma^2}}$$

where:  $\mu$  is the mean  $\sigma$  is the standard deviation  $\sigma^2$  is the variance

### Binomial distribution formulas

mean

$$\mu = n * p$$

In other words, a fair coin has a probability of a positive outcome (heads)  $p = 0.5$ . If you flip a coin 20 times, the mean would be  $20 * 0.5 = 10$ ; you'd expect to get 10 heads.

variance

$$\sigma^2 = np(1 - p)$$

Continuing with the coin example,  $n$  would be the number of coin tosses and  $p$  would be the probability of getting heads.

In other words, the standard deviation is the square root of the variance.

probability density function

$$f(k, n, p) = \frac{n!}{k!(n-k)!} p^k (1-p)^{(n-k)}$$