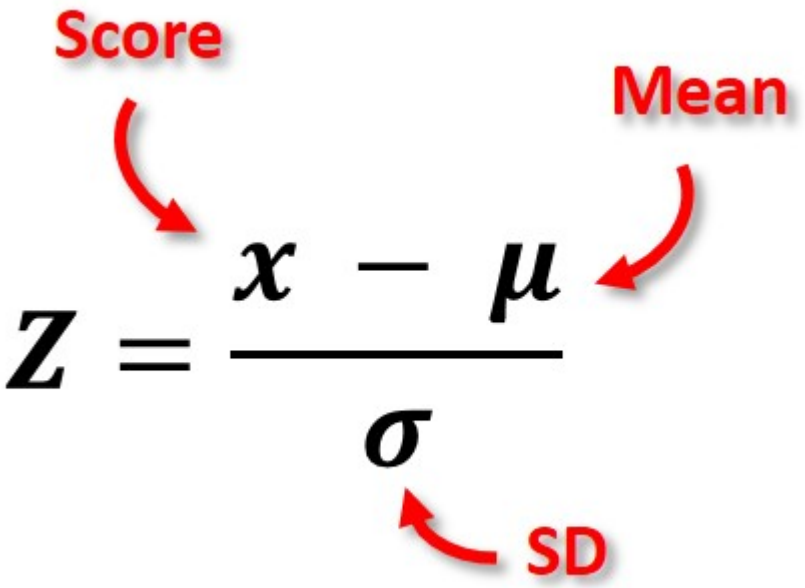
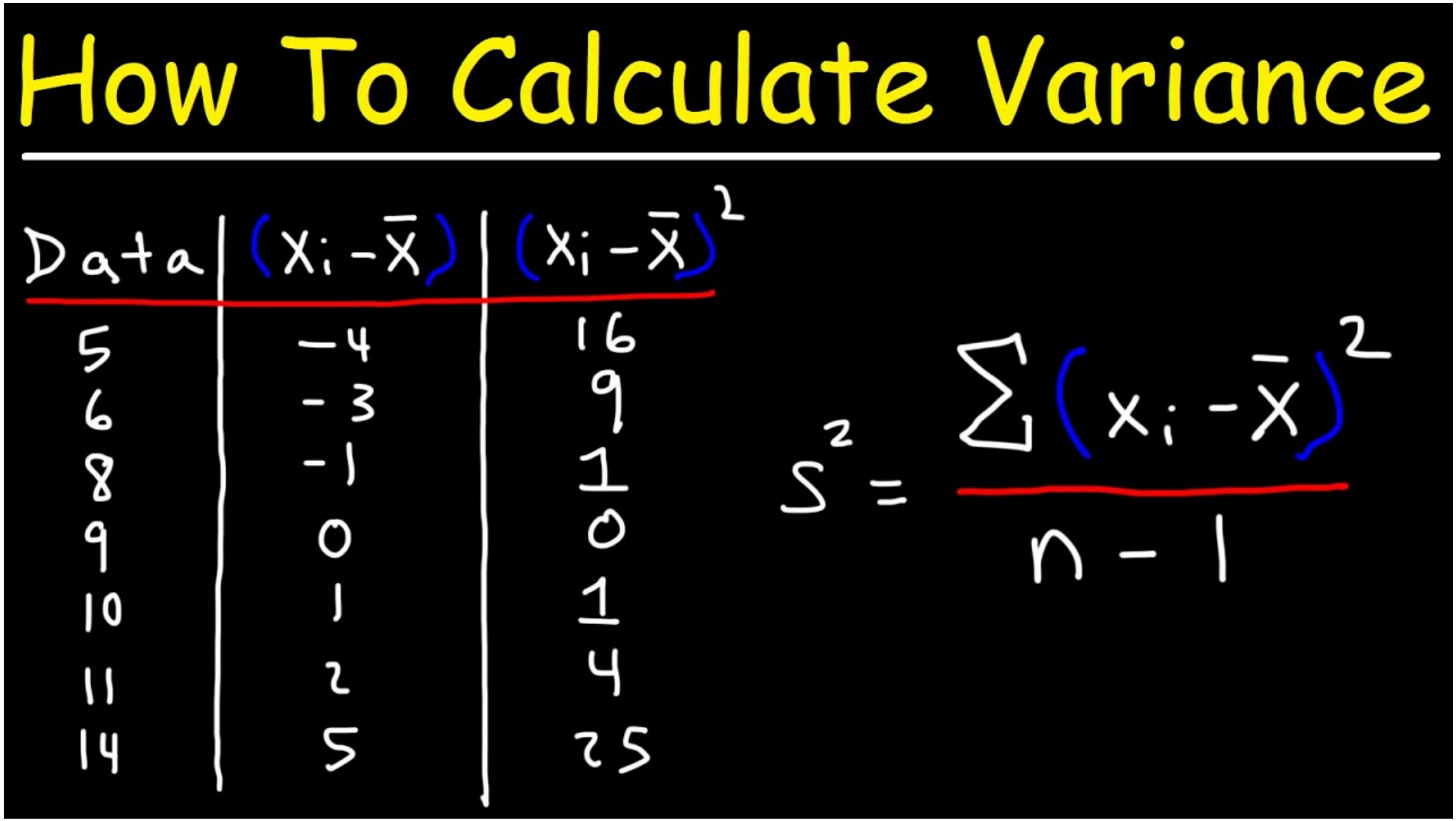
```
# why do we use z variable?
# When we draw samples from any population they follow a normal distribution hence for a normal standard dist
# sample population is converted into z variable(a z variable is essentially a normal distribution).
# A population variance is represented by sigma2
# A sample  variance is represented by S.
# when our formula contains n(Degree of freedom) at denominator it represents the population size
# when our formula contains n-1(DOF) at denominator it represents the sample size
# to convert random variable x into distriubtion function z we use formula
```



What is difference between sample variance and variance of sample?

1. Sample variance(S) - variance between different samples (x1,x2,x3....) (generally for sample mean)
2. variance of sample- variance of particular or specific or targeted sample(x1) Before calculating the variance we have to know the sample characterstics like

1. is it normal distribution
2. chi square distribution as each of them have different formula formula for variance.



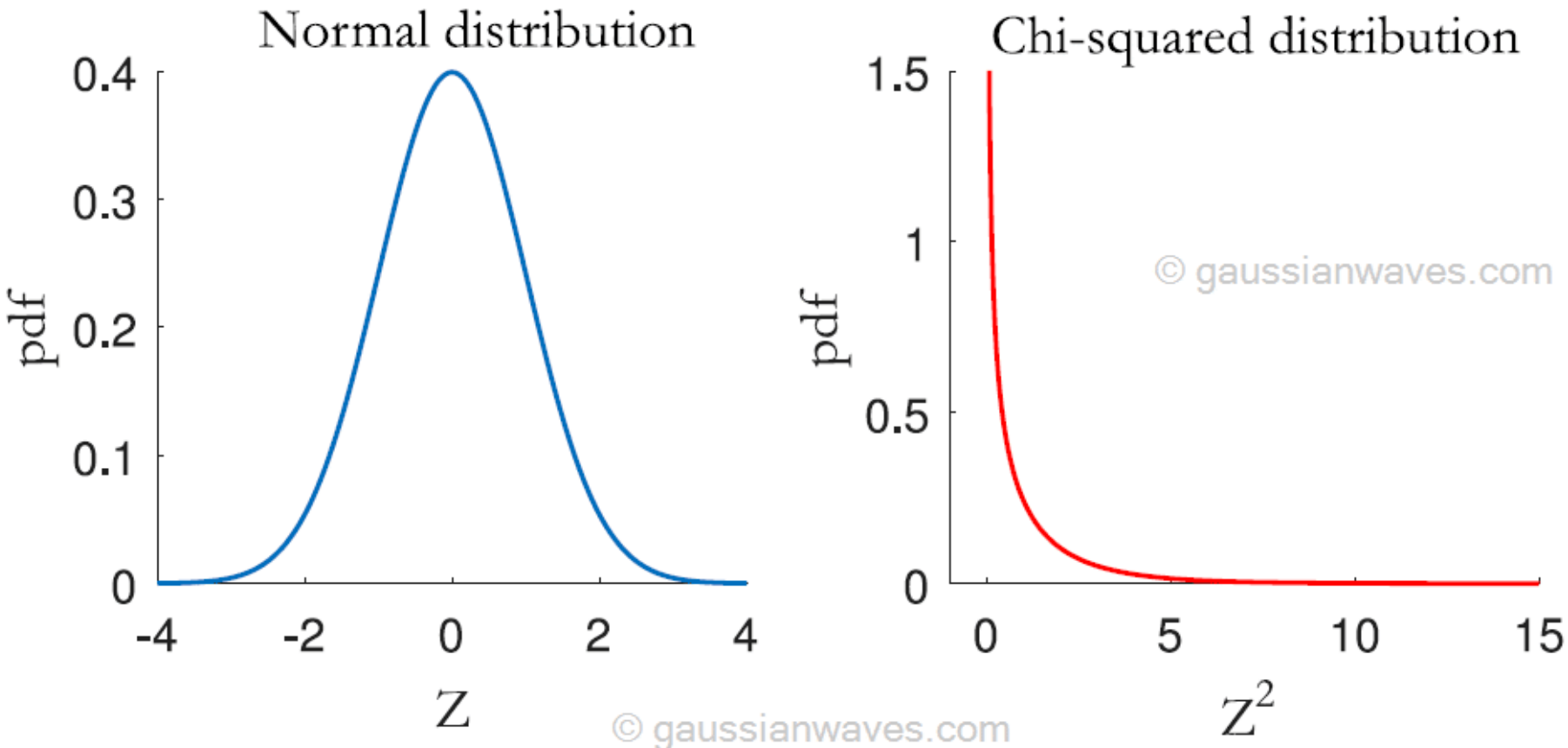
A sample mean always follow a Normal distribution

In poisson distribution the mean,variance is lamba.

When N(25,40) is given understand it normal distribution(with mean(mu), with variance= sigma2/number of samples)

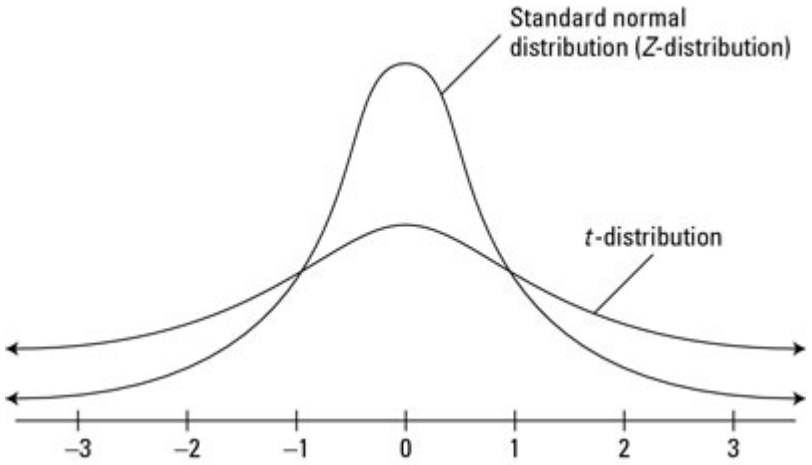
When do we use chi square chart?

1. Since the sample always follows normal distribution- what if the population follows a normal distribution.
2. When sample drawn from normal distribution and we have data on standard deviation and we want variance of the sample then we use chi square chart.



When do we use T distribution?

1. When we need variance of sample which is drawn from normal distribution population and variance of the sample calculated without using Standard deviation. We use t distribution.
2. Population shall be Normal distribution.



What is f results?

1. Two different Population - two different standard deviation-comparison of variance between those two distribution will give f results.

```
#How to call statistical tool in python?

from scipy.stats import uniform
from scipy.stats import norm
from scipy.stats import chi2
from scipy.stats import t
from scipy.stats import f
import math

# this imports the distribution tools of statistics.
#how to use them?
```

```
# code : norm.cdf(norm.mean(), norm.std(), norm.var())

norm.cdf(35,40,12)
```

```
0.33846111951068963
```

Double-click (or enter) to edit

```

```

```
0.9631925922224911
```

```

```