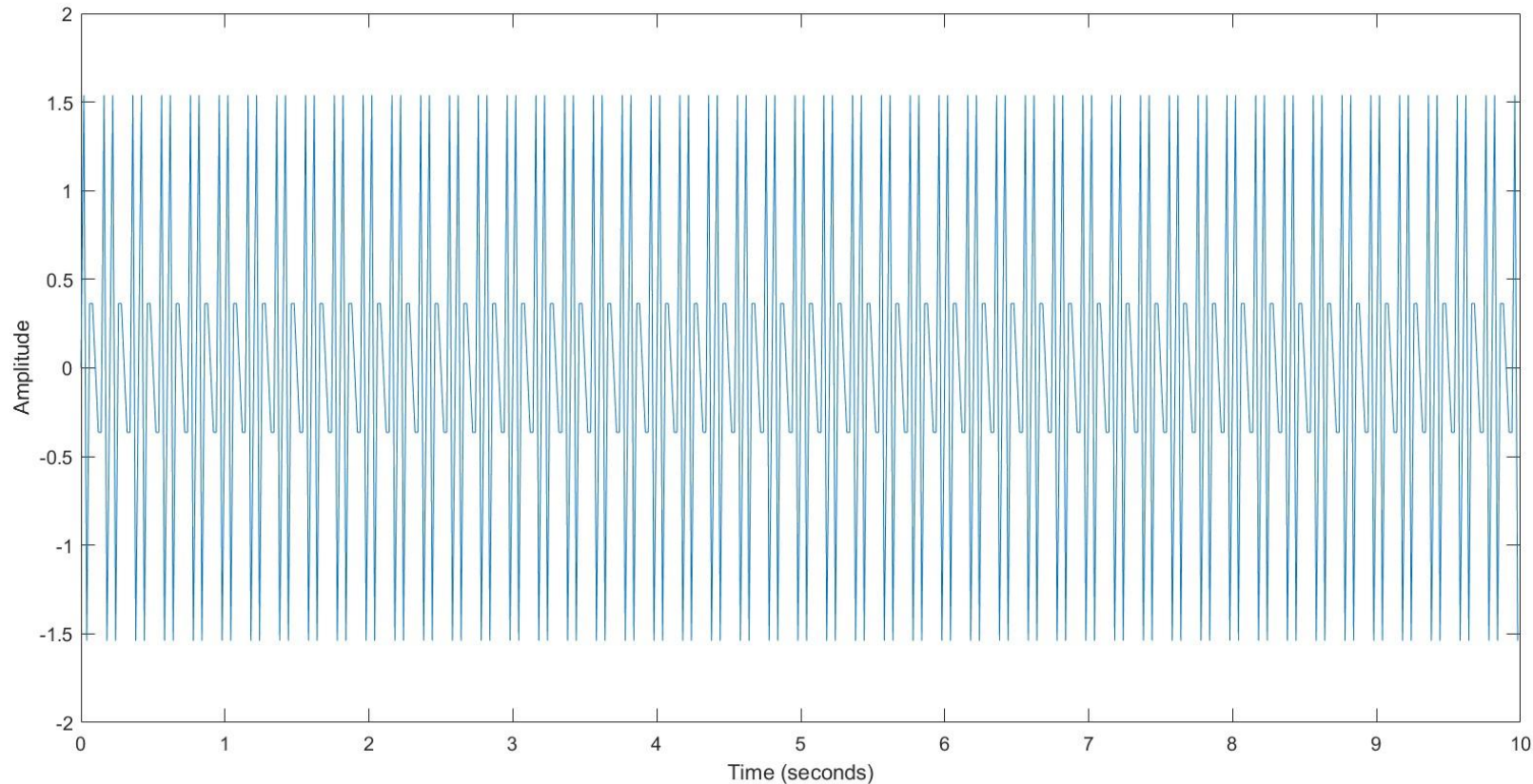# What is Fourier Transform?

The Fourier Transform takes a time-based pattern, measures every possible cycle, and summarises the characteristics of each cycle:

The amplitude,

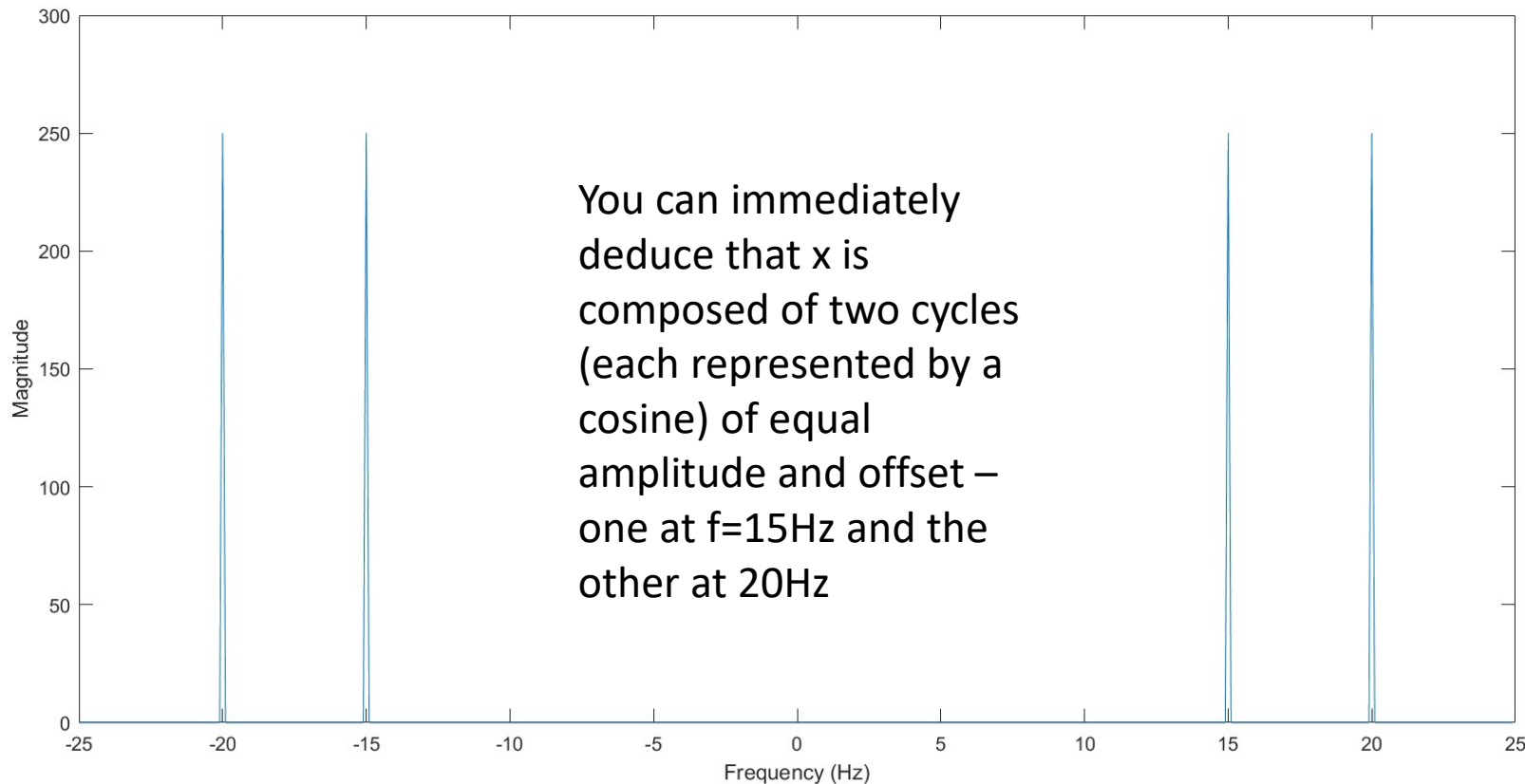The offset,

The rotation speed (or FREQUENCY)

A signal x that changes in amplitude over time can be represented as x(t) as shown below:

Can you write the equation of x(t) just by inspecting the time representation?

It is not easy

A signal x that changes in amplitude over time can be represented as X(f) as shown below:

You can immediately deduce that x is composed of two cycles (each represented by a cosine) of equal amplitude and offset – one at f=15Hz and the other at 20Hz

$$x = \sin(2\pi 15 t) + \sin(2\pi 20 t)$$

Let's look at the power of the signal