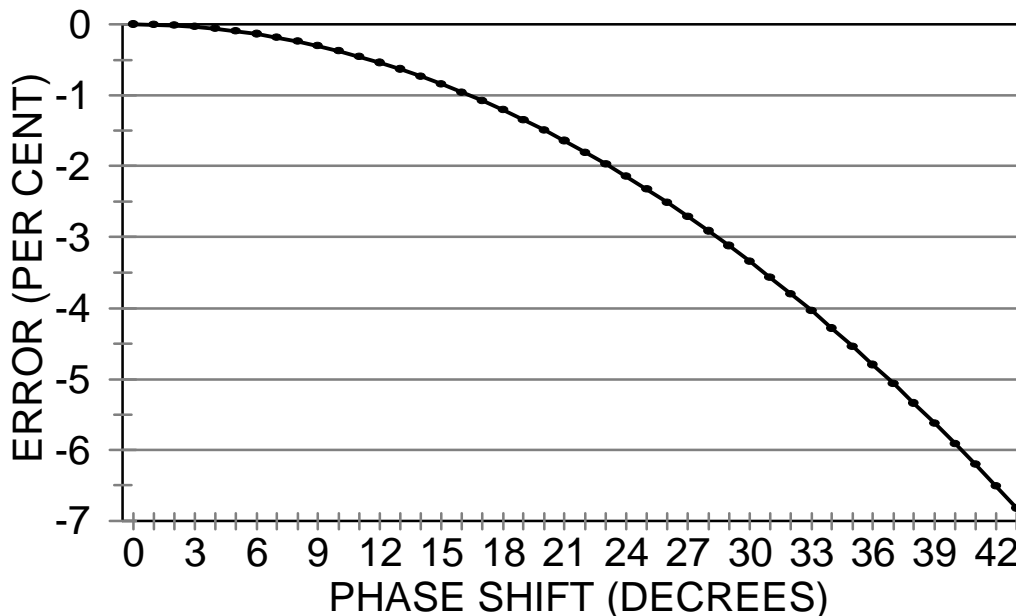


## CALCULATION OF ERRORS DUE TO PHASE DIFFERENCE BETWEEN VOLTAGE AND CURRENT SAMPLES

It is a fairly simple matter to compute the error which will result from sampling the current values at a slightly different time than the voltage values in our wattmeter. Such a computation is shown below. It was generated by a Pascal program and imported into a spread sheet for graphing.

# COMPUTATIONAL ERROR



With 8-bit data, the minimum error (other than 0) will be 1 part in 128 or about 0.8%. The above chart indicates that the error may be held to less than 0.8% if the difference in sample times is less than about 15 degrees. If 15 degrees corresponds to 1 microsecond, 360 degrees correspond to 24 microseconds. This would indicate that the maximum test frequency which could be measured with no more than 1 percent error is about 40 KHz.

Next, what affect does the sampling rate have. This may also be computed easily. This is shown below. When the samples begin to exceed 60 degree intervals, the computational error begins to become noticeable. This would indicate that the maximum frequency, even taking both samples at the same time, is about 160KHz.

## ERRORS DUE TO SAMPLE RATE

