Report on design of a CORDIC device for arctan

# Introduction

## The CORDIC algorithm

The CORDIC algorithm provides a mean to compute trigonometric functions iteratively using only shifts and adds, which are cheap to implement in a dedicated electronic device. It has two sets of equation:

* Rotation, where a vector iteratively rotated by a specified angle
* Vectoring, where a vector is iteratively rotated to an angle of 0 rad to measure the original angle.

For the computation of arctangent, only the latter is needed. The equations are as follows:

Where if , otherwise.

So, for we have

Where is a gain that can be ignored, while is the value we aimed to compute given that .