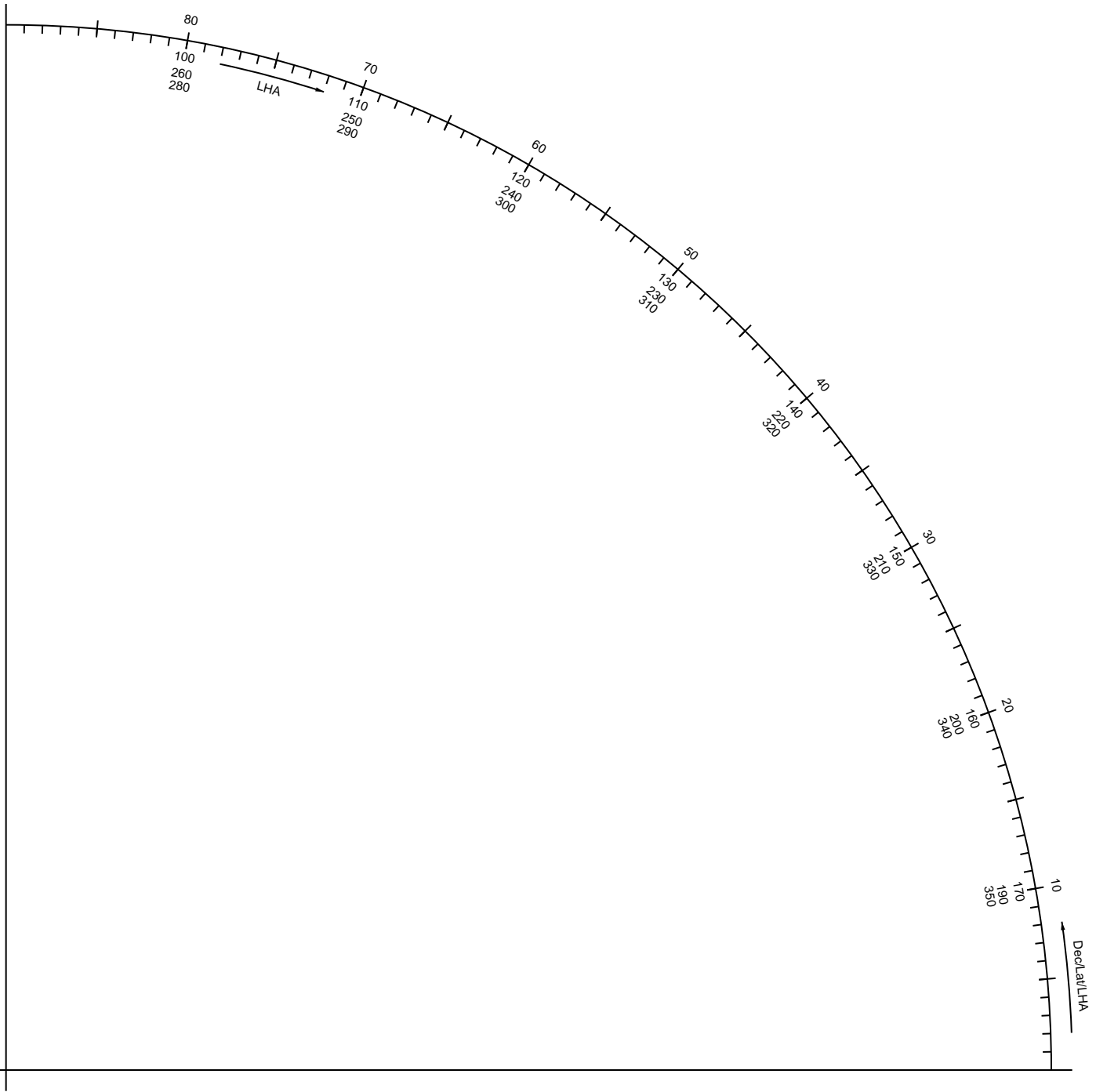


Worksheet for graphical Sight-Reduction

Observer at _____.° N/S Latitude

Star with _____.° N/S Declination and _____.° LHA



$$H_c = a \sin(\sin(\text{Lat}) \sin(\text{Dec}) + \cos(\text{Lat}) \cos(\text{Dec}) \cos(\text{LHA}))$$

$\cos(\text{Dec}) \cos(\text{Lat}) \cos(\text{LHA})$

is positive/negative

$\sin(\text{Lat}) \sin(\text{Dec})$

is positive/negative

}

if same sign: add components or

if opposite sign: subtract components

$$Z = a \sin(\sin(\text{LHA}) \cos(\text{Dec}) / \cos(H_c))$$

Worksheet for graphical Sight-Reduction - Example -Step 1

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

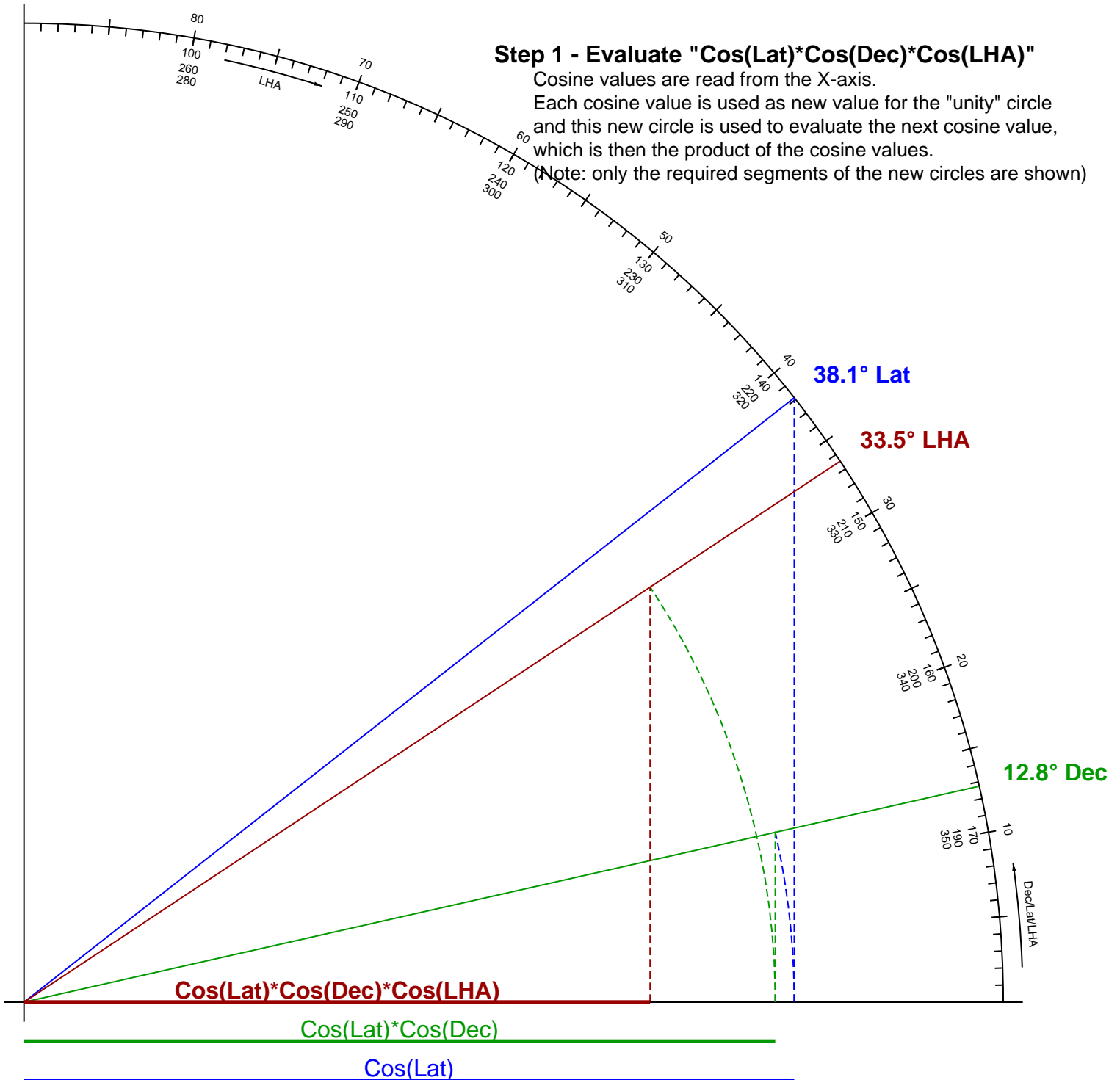
Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)

Step 1 - Evaluate " $\text{Cos}(\text{Lat}) \cdot \text{Cos}(\text{Dec}) \cdot \text{Cos}(\text{LHA})$ "

Cosine values are read from the X-axis.

Each cosine value is used as new value for the "unity" circle and this new circle is used to evaluate the next cosine value, which is then the product of the cosine values.

(Note: only the required segments of the new circles are shown)



Worksheet for graphical Sight-Reduction - Example -Step 2

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

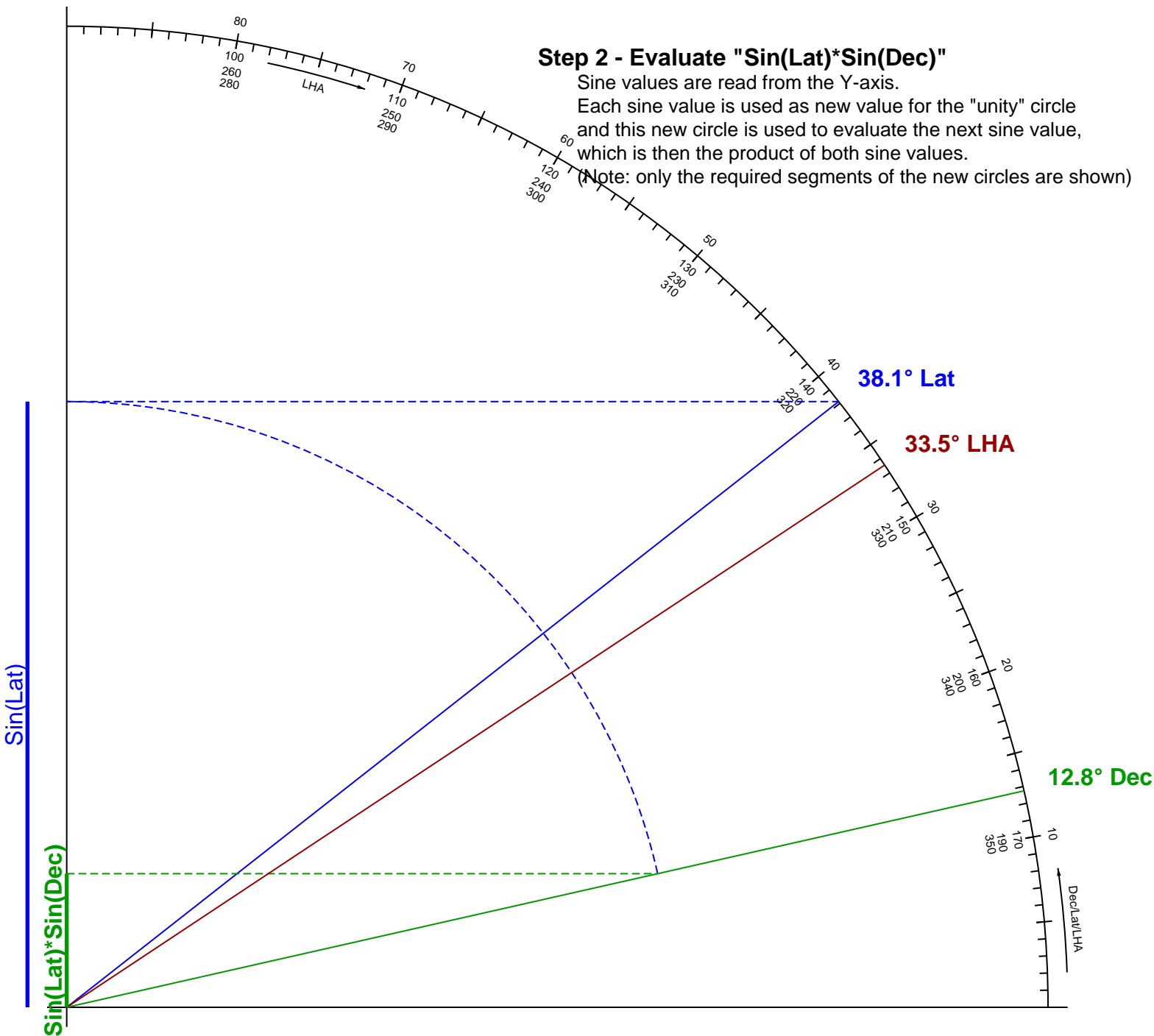
Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)

Step 2 - Evaluate "Sin(Lat)*Sin(Dec)"

Sine values are read from the Y-axis.

Each sine value is used as new value for the "unity" circle and this new circle is used to evaluate the next sine value, which is then the product of both sine values.

(Note: only the required segments of the new circles are shown)

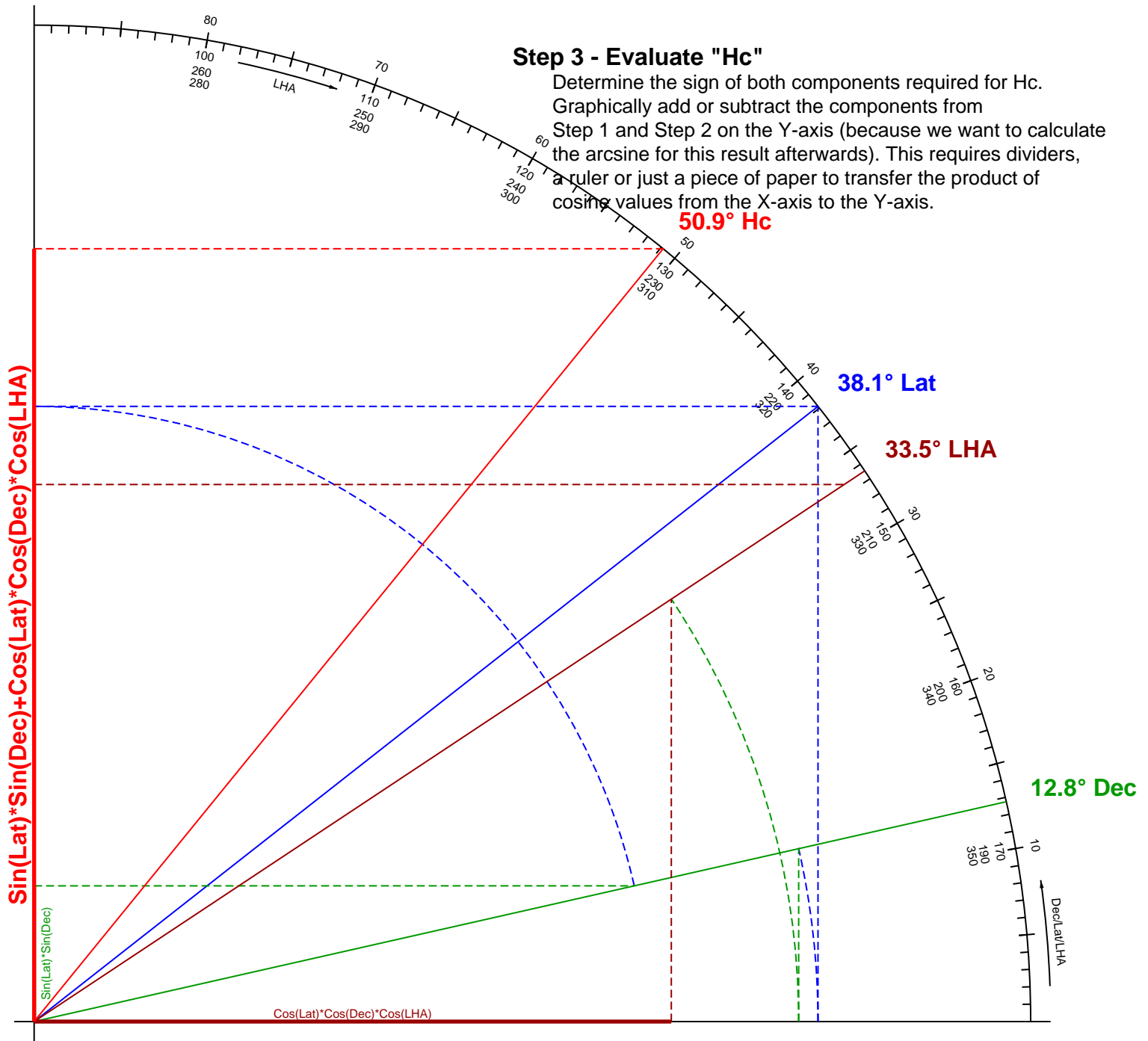


Worksheet for graphical Sight-Reduction - Example -Step 3

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)



$$H_c = a \text{Sin}(\text{Sin(Dec)*Sin(Lat) + Cos(Dec)*Cos(Lat)*Cos(LHA)})$$

$\text{Cos(Lat)*Cos(Dec)*Cos(LHA)}$

is positive

Sin(Lat)*Sin(Dec)

is positive

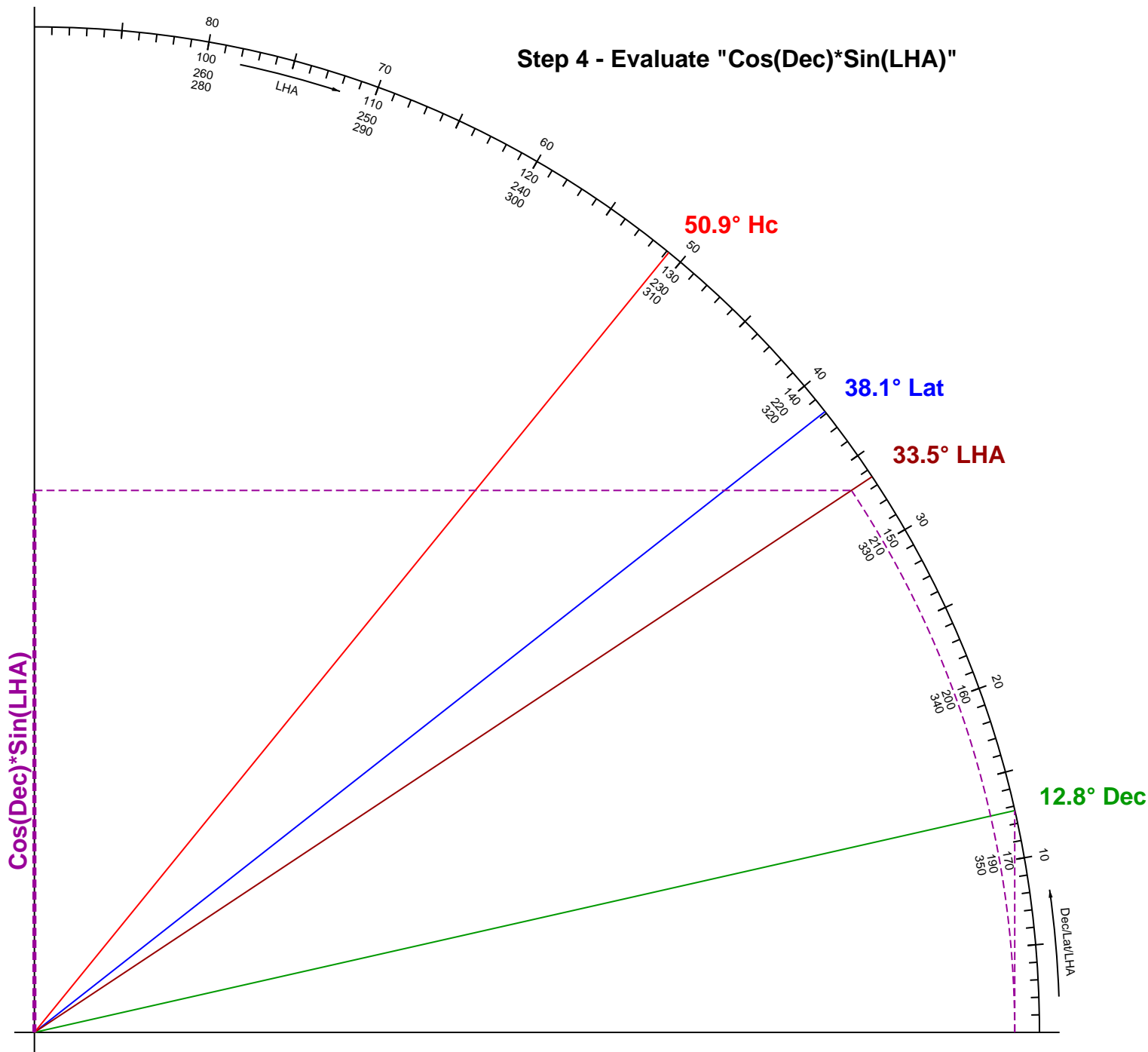
} ADD components

Worksheet for graphical Sight-Reduction - Example -Step 4

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)



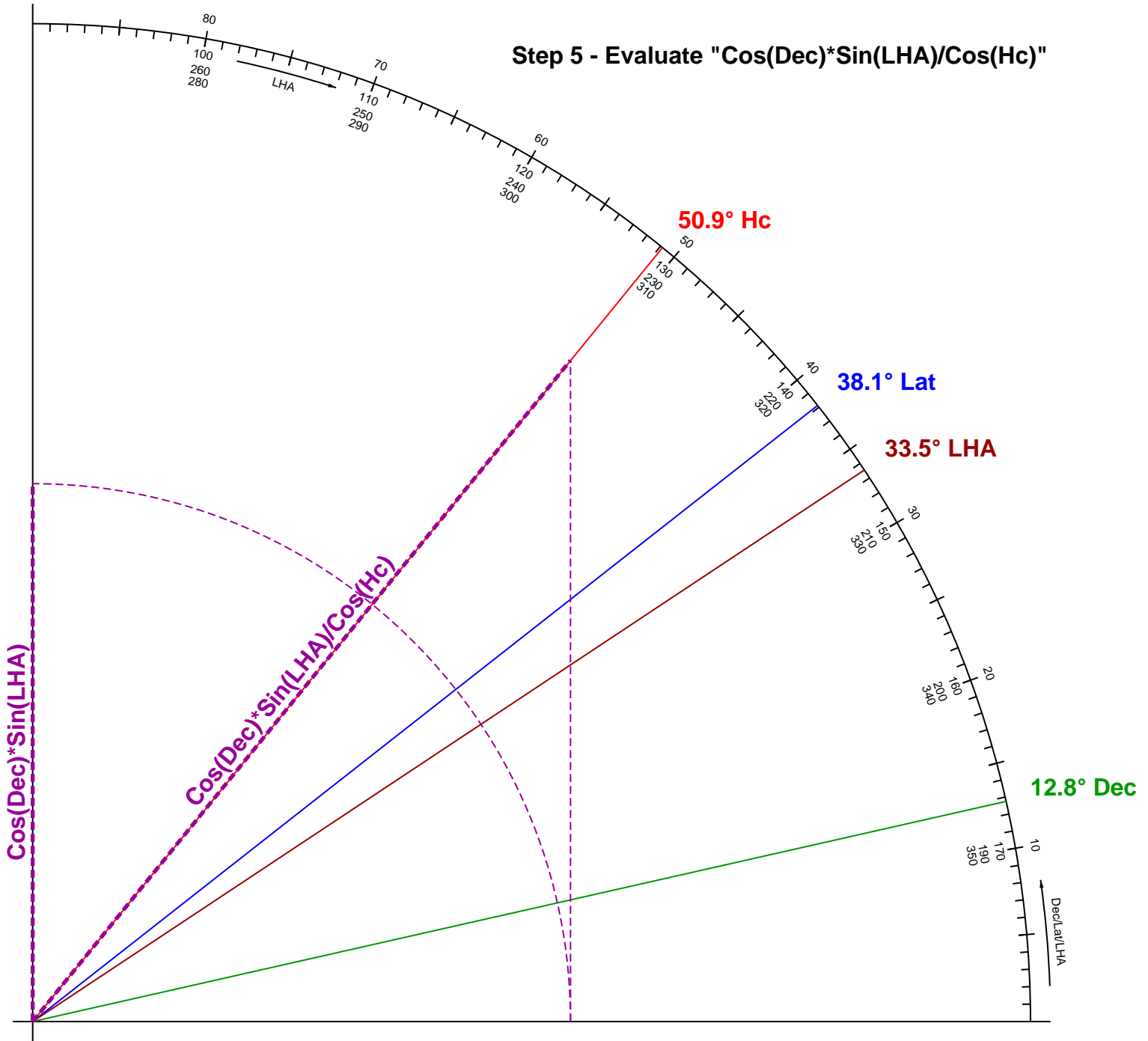
$$Z = a \sin \left(\frac{\text{Cos(Dec)*Sin(LHA)}}{\text{Cos(Hc)}} \right)$$

Worksheet for graphical Sight-Reduction - Example -Step 5

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)



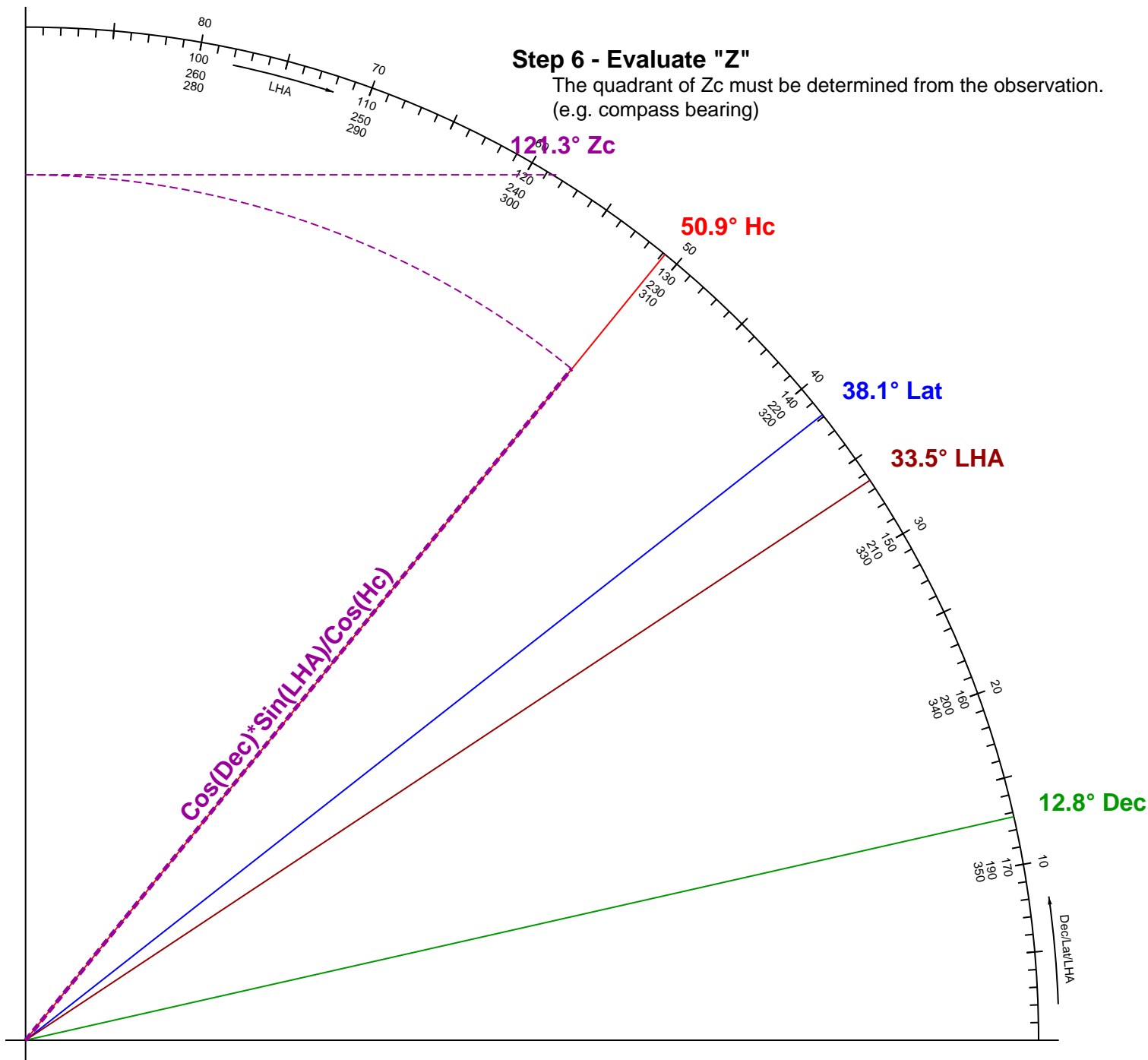
$$Z = a \sin \left(\frac{\cos(\text{Dec}) \cdot \sin(\text{LHA})}{\cos(\text{Hc})} \right)$$

Worksheet for graphical Sight-Reduction - Example -Step 6

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)



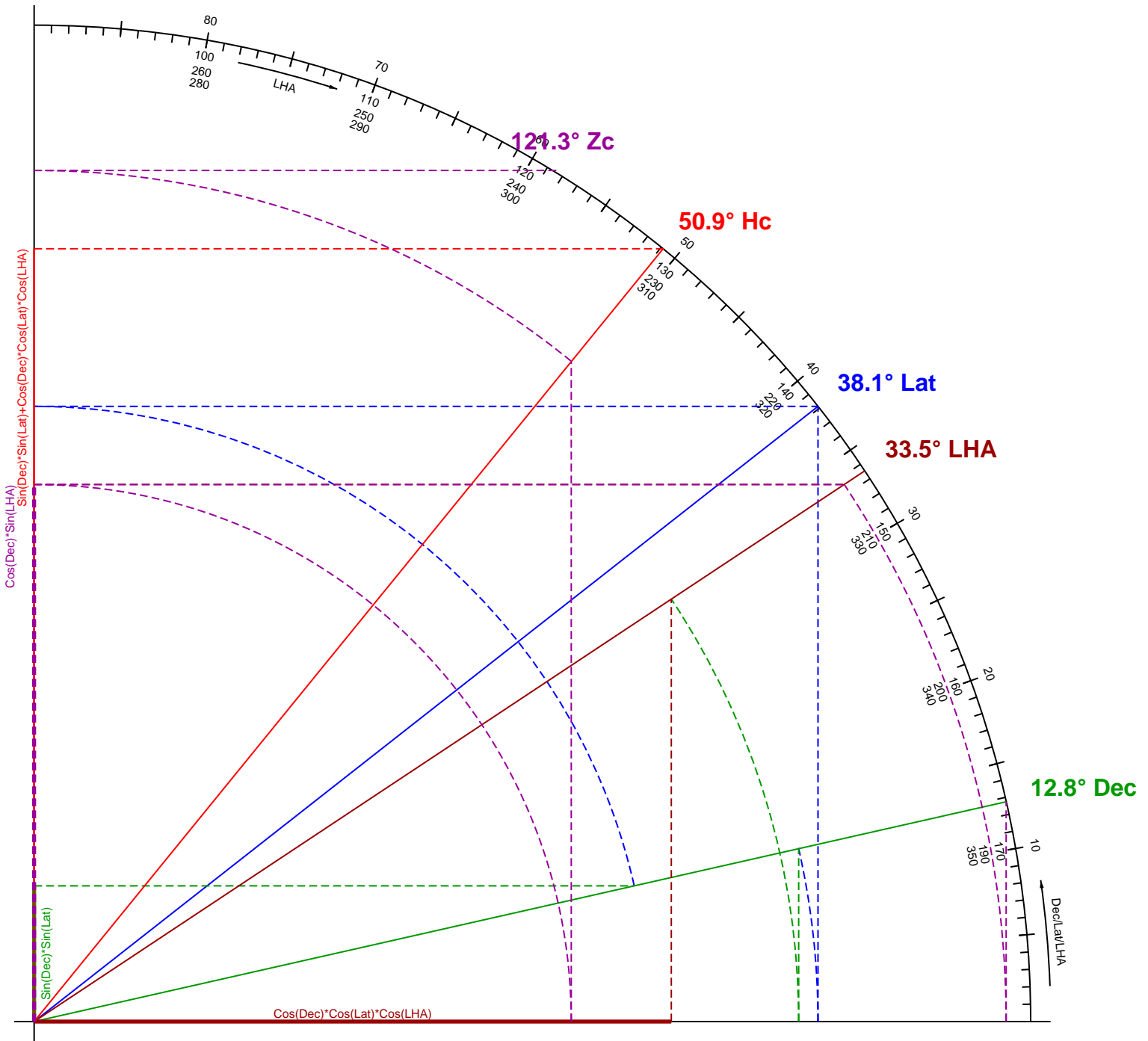
$$Z = a\text{Sin}(\text{Cos(Dec)*Sin(LHA) / Cos(Hc)})$$

Worksheet for graphical Sight-Reduction - Example

Observer at 38.1°N Latitude

Star with 12.8°N Declination and 33.5° LHA

Mathematical results for the Sight Reduction: $H_c=50.9^\circ$ $Z_c=121.3^\circ$ (58.7°)



$$H_c = a \sin(\sin(\text{Dec}) \cdot \sin(\text{Lat}) + \cos(\text{Dec}) \cdot \cos(\text{Lat}) \cdot \cos(\text{LHA}))$$

$$\sin(\text{Dec}) \cdot \sin(\text{Lat})$$

is positive

$$\cos(\text{Dec}) \cdot \cos(\text{Lat}) \cdot \cos(\text{LHA})$$

is positive

} ADD components

$$Z = a \sin(\sin(\text{LHA}) \cdot \cos(\text{Dec}) / \cos(\text{Hc}))$$