

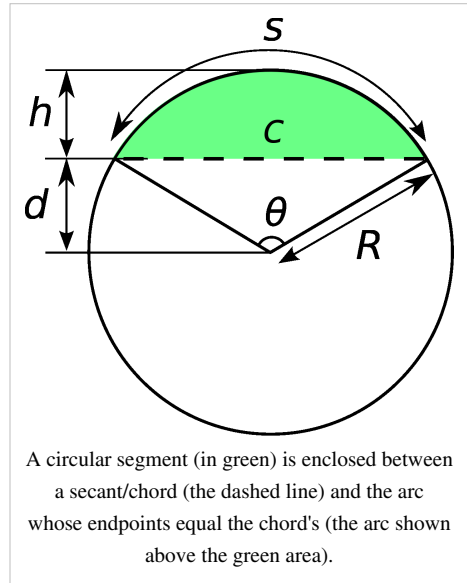
# Circular segment

In geometry, a **circular segment** (symbol:  $\text{⌒}$ ) is an area of a circle informally defined as an area which is "cut off" from the rest of the circle by a secant or a chord.

## Formulas

Let  $R$  be the radius of the circle,  $\theta$  is the central angle in radians,  $\alpha$  is the central angle in degrees,  $c$  the chord length,  $s$  the arc length,  $h$  the height of the segment, and  $d$  the height of the triangular portion.

- The radius is  $R = h + d = h/2 + c^2/8h$
- The arc length is  $s = \frac{\alpha}{180} \pi R = \theta R$
- The chord length is  $c = 2R \sin \frac{\theta}{2} = R \sqrt{2 - 2 \cos \theta}$
- The height is  $h = R(1 - \cos \frac{\theta}{2}) = R - \sqrt{R^2 - \frac{c^2}{4}}$
- The angle is  $\theta = 2 \arccos \frac{d}{R} = 2 \arcsin \frac{c}{2R}$



## Area

The area of the circular segment is equal to the area of the circular sector minus the area of the triangular portion.

$$A = \pi R^2 \cdot \frac{\theta}{2\pi} - \frac{R^2 \sin \theta}{2} = \frac{R^2}{2} (\theta - \sin \theta) = \frac{R^2}{2} \left( \frac{\alpha\pi}{180} - \sin \frac{\alpha\pi}{180} \right)$$

## External links

- Weisstein, Eric W., "Circular segment"<sup>[1]</sup>, *MathWorld*.
- Definition of a circular segment<sup>[2]</sup> With interactive animation
- Formulae for area of a circular segment<sup>[3]</sup> With interactive animation

## References

- [1] <http://mathworld.wolfram.com/CircularSegment.html>  
 [2] <http://www.mathopenref.com/segment.html>  
 [3] <http://www.mathopenref.com/segmentarea.html>

# Article Sources and Contributors

**Circular segment** *Source:* <http://en.wikipedia.org/w/index.php?oldid=572716040> *Contributors:* Al Lemos, CWii, Canuckian89, Charles Matthews, Clovis Sangrail, Cpt jeltz, Duoduoduo, Elb2000, Gifflite, Gurglegogo, Götz, Henning Makholm, Iameukarya, Isnow, J'raxis, JPaestpreornJeolhlna, Jjhepburn, Kiensvay, La Pianista, Lutusp, Maksim-e, Marino-slo, Markhurd, Michael Hardy, MrOllie, Olaf, Perey, Pgartenburg1234, Python eggs, Rmashhadi, RuM, Sbesson, Skythiru, Sobreira, StuRat, SuneJ, Synethos, Vints, Walibi's are cool, Wellmann, Wernher, WikiHannibal, WillNess, ZooFari, Σ, 99 anonymous edits

# Image Sources, Licenses and Contributors

**Image:Circularsegment.svg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:Circularsegment.svg> *License:* Public Domain *Contributors:* Sbesson

# License

Creative Commons Attribution-Share Alike 3.0  
[//creativecommons.org/licenses/by-sa/3.0/](http://creativecommons.org/licenses/by-sa/3.0/)