3.21 Segment of a Circle

Radius of a circle: R
Arc length: s
Chord: a
Central angle (in radians): x
Central angle (in degrees): α
Height of the segment: h
Perimeter: L
Area: S

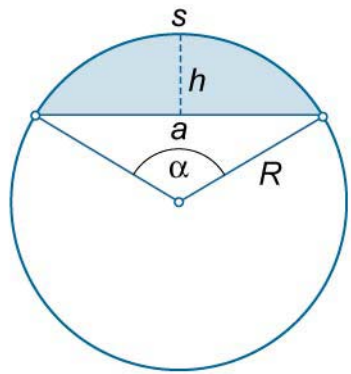

Figure 36.

271. $a = 2\sqrt{2hR - h^2}$

272. $h = R - \frac{1}{2}\sqrt{4R^2 - a^2}\,,\ h < R$

273. $L = s + a$

274. $S = \frac{1}{2}\left[sR - a(R-h)\right] = \frac{R^2}{2}\left(\frac{\alpha\pi}{180^\circ} - \sin\alpha\right) = \frac{R^2}{2}(x - \sin x)$,

$S \approx \frac{2}{3}ha$.