

$$\frac{1}{2} r^2 d\theta = \left(\frac{4a^2}{2} - 4a^2 + a^2 \sin^2 \theta \right) d\theta$$

$$= 2a^2 d\theta - 4a^2 d\theta +$$

$$\frac{1}{2} r^2 d\theta = 2a^2 (\cos^2 \theta - 1) +$$

$$r^2 = 4a^2 \cos^2 \theta - 4a^2 + a^2 \sin^2 \theta$$

$$\frac{1}{2} r^2 d\theta = \left(2a^2 \cos^2 \theta - 2a^2 + \frac{a^2}{2} \sin^2 \theta \right) d\theta$$

$$\int = 2a^2 \left(\theta + \frac{\sin 2\theta \cos \theta}{2} \right) - 2a^2 \theta + \frac{a^2}{2} \int \sin^2 \theta d\theta$$

$$2a^2 \left(1 - \frac{\pi}{2} - \frac{\pi}{4} \right)$$



=

$$r \cos \theta = a \cos 2\theta$$

$$r = \frac{a \cos \theta}{\cos \theta}$$

$$\theta = \frac{\pi}{2} \quad r = \frac{a \cos \pi}{\cos \frac{\pi}{2}} = -a$$

$$A = \frac{2}{3} R^2$$

$$r \cos \theta = a \cos 2\theta = a(\cos^2 \theta - \sin^2 \theta)$$

$$r = \frac{a(\cos^2 \theta - \sin^2 \theta)}{\cos \theta}$$

$$\sqrt{x^2 + y^2} = a \cos \theta - a \frac{\sin^2 \theta}{\cos \theta}$$

$$\sqrt{x^2 + y^2} = x - a \sin \theta \tan \theta$$

$$= x - y \cdot \tan \theta = x - y \frac{y}{x}$$

$$= x - \frac{y^2}{x} = \frac{x^2 - y^2}{x}$$

$$x^2 + y^2 = \frac{x^2 - 2x^2 y^2 + y^4}{x}$$

$$x^2(x^2 + y^2) = x^2 - y^2$$

$$x^3 + x^2 y^2 = x^2 - 2x^2 y^2 + y^4$$

$$x^2 - y^2 =$$

$$3x^2 y^2 = y^4$$

$$3x^2 = y^2$$

Principles of Algebra & Geometry