

$$\int \frac{dx}{\sqrt{(x-\alpha)(\beta-x)}} \quad (\alpha < x < \beta)$$

$$S(dx/\sqrt{(x-a)(b-x)})$$

$$x=a*\cos^2y+b\sin^2y; \quad 0 < y < \pi/2$$

$$x-a=a*\cos^2y+b\sin^2y-a=a(\cos^2y-1)+b\sin^2y=$$

$$=b\sin^2y-a\sin^2y=\sin^2y(b-a)$$

$$b-x=b-a*\cos^2y-b\sin^2y=b(1-\sin^2y)-a*\cos^2y=$$

$$=b\cos^2y-a*\cos^2y=\cos^2y(b-a)$$

$$dx=d(a*\cos^2y+b\sin^2y)=a*d(\cos^2y)+b*d(\sin^2y)=$$

$$=a*(-\sin 2y)dy+b*\sin 2y*dy=\sin 2y(b-a)dy$$

$$S(dx/\sqrt{(x-a)(b-x)})=S(\sin 2y(b-a)dy/\sqrt{(\sin^2y(b-a))(\cos^2y(b-a))})=$$

$$=S(\sin 2y(b-a)dy/\sqrt{\sin^2y*\cos^2y(b-a)^2})=$$

$$=S(\sin 2ydy/(\sin y*\cos y))=S(2\cos y \sin y dy/(\sin y*\cos y))=$$

$$=S(2dy)=2y+C=2\arccos(\sqrt{(x-b)/(a-b)})+C$$

$$x=a*\cos^2y+b\sin^2y$$

$$a\cos^2y+b(1-\cos^2y)=x$$

$$a\cos^2y+b-b\cos^2y=x$$

$$\cos^2y(a-b)+b=x$$

$$\cos^2y=(x-b)/(a-b)$$

$$\cos y=\sqrt{(x-b)/(a-b)}$$

$$y=\arccos(\sqrt{(x-b)/(a-b)})$$