

$$2 \int_0^{\pi-\alpha} \int_0^r r d\phi dr + 2 \int_0^{r \cos \alpha} x \tan \alpha dx = \int_0^{\pi-\alpha} r^2 d\phi = (\pi - \alpha) r^2 + r^2 \cos^2 \alpha \frac{\sin \alpha}{\cos \alpha} =$$
$$(\pi - \alpha) r^2 + r^2 \sin \alpha \cos \alpha = r^2 (\pi - \alpha + \sin \alpha \cos \alpha)$$