1. 
$$\int \frac{1}{(1-x^2)\sqrt{1+x^2}} dx$$
.

Putting  $x = \frac{1}{t}$  and  $dx = -\frac{1}{t^2}dt$ , we get

$$I = \int rac{\left(-rac{1}{t^2}
ight)dt}{\left(1-rac{1}{t^2}
ight)\sqrt{1+rac{1}{t^2}}} = -\int rac{tdt}{\left(t^2-1
ight)\sqrt{t^2+1}}$$

Let  $r^2 + I = u^2$ , or 2tdt = 2udu

$$\therefore I = -\int \frac{du}{u^2 - (\sqrt{2})^2}$$

$$= -\frac{1}{2\sqrt{2}} \log \left| \frac{u - \sqrt{2}}{u + \sqrt{2}} \right| + C$$

$$= -\frac{1}{2\sqrt{2}} \log \left| \frac{\sqrt{t^2 + 1} - \sqrt{2}}{\sqrt{t^2 + 1} + \sqrt{2}} \right| + C$$