Theorem The standard Cauchy distribution is a special case of the Student's t distribution when $n = 1$.

Proof The Student's t distribution has probability density function

$$f(x) = \frac{\Gamma\left(\frac{n+1}{2}\right)}{\sqrt{n\pi}\,\Gamma\left(\frac{n}{2}\right)\left(\frac{x^2}{n}+1\right)^{(n+1)/2}} \qquad -\infty < x < \infty.$$

When $n = 1$, this becomes

$$f(x) = \frac{\Gamma(1)}{\Gamma\left(\frac{1}{2}\right)\sqrt{\pi}\,(x^2+1)} \qquad -\infty < x < \infty,$$

where $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$ and $\Gamma(1) = 1$. This reduces to

$$f(x) = \frac{1}{\pi\,(1+x^2)} \qquad -\infty < x < \infty,$$

which is the probability density function of the standard Cauchy distribution.

APPL verification: The APPL statements

```
TRV(1);
StandardCauchyRV();
```

yield the identical probability density functions

$$f(x) = \frac{1}{(1+x^2)\,\pi} \qquad -\infty < x < \infty.$$