

FORMULA 3.197.11

$$\int_0^1 \frac{x^{p-1/2} dx}{(1-x)^p (1+qx)^p} = \frac{2\Gamma(p + \frac{1}{2})\Gamma(1-p) \cos^{2p}(z) \sin[(2p-1)z]}{\sqrt{\pi} (2p-1) \sin z}$$

where $z = \tan^{-1}(\sqrt{q})$.