$$\int^{x} \frac{1}{1+()^{2}} = {}^{x}\cancel{t}$$

$$\int^{x} \frac{1}{\left(1+()^{2}\right)^{n+1}} = \frac{1}{n}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{n-\ 1/2}{n}\int^{x}\frac{1}{\left(1+()^{2}\right)^{n}}$$

$$= \frac{1}{n}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{n-\ 1/2}{n}\left(\frac{1}{n-1}\frac{x/2}{\left(1+x^{2}\right)^{n-1}} + \frac{n-3/2}{n-1}\int^{x}\frac{1}{\left(1+()^{2}\right)^{n-1}}\right)$$

$$= \frac{{}^{0}(n-\ 1/2)}{{}_{1}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{{}^{1}(n-\ 1/2)}{{}_{2}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-1}} + \frac{{}^{2}(n-\ 1/2)}{{}_{2}(n)}\int^{x}\frac{1}{\left(1+()^{2}\right)^{n-1}}$$

$$= \frac{{}^{0}(n-\ 1/2)}{{}_{1}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{{}^{1}(n-\ 1/2)}{{}_{2}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-1}} + \frac{{}^{2}(n-\ 1/2)}{{}_{2}(n)}\left(\frac{1}{n-2}\frac{x/2}{\left(1+x^{2}\right)^{n-2}} + \frac{n-5/2}{n-2}\int^{x}\frac{1}{\left(1+()^{2}\right)^{n-2}}\right)$$

$$= \frac{{}^{0}(n-\ 1/2)}{{}_{1}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{{}^{1}(n-\ 1/2)}{{}_{2}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-1}} + \frac{{}^{2}(n-\ 1/2)}{{}_{3}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-2}} + \frac{{}^{3}(n-\ 1/2)}{{}_{3}(n)}\int^{x}\frac{1}{\left(1+()^{2}\right)^{n-2}}$$

$$= \frac{{}^{0}(n-\ 1/2)}{{}_{1}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n}} + \frac{{}^{1}(n-\ 1/2)}{{}_{2}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-1}} + \frac{{}^{2}(n-\ 1/2)}{{}_{3}(n)}\frac{x/2}{\left(1+x^{2}\right)^{n-2}} + \cdot\cdot + \frac{{}^{n-1}(n-\ 1/2)}{{}_{n}(n)}\frac{x/2}{1+x^{2}}$$

$$+\frac{{}^{n}(n-\ 1/2)}{{}_{n}(n)}\int^{x}\frac{1}{1+()^{2}}$$