$$1-\frac{3!}{(1!2!)^3}x^2+\frac{6!}{(2!4!)^3}x^4-...=\left(1+\frac{x}{(1!)^3}+\frac{x^2}{(2!)^3}+...\right)\left(1-\frac{x}{(1!)^3}+\frac{x^2}{(2!)^3}-...\right) \tag{1}$$

$$1-5\left(\frac{1}{2}\right)^3+9\left(\frac{1\cdot 3}{2\cdot 4}\right)^3-13\left(\frac{1\cdot 3\cdot 5}{2\cdot 4\cdot 6}\right)^3+...=\frac{2}{\pi} \tag{2}$$

$$1+9\left(\frac{1}{4}\right)^4+17\left(\frac{1\cdot 5}{4\cdot 8}\right)^4+25\left(\frac{1\cdot 5\cdot 9}{4\cdot 8\cdot 12}\right)^4+...=\frac{2^{\frac{3}{2}}}{\pi^{\frac{1}{2}}\left[\Gamma\left(\frac{3}{4}\right)\right]^2} \tag{3}$$

$$1-5\left(\frac{1}{2}\right)^5+9\left(\frac{1\cdot 3}{2\cdot 4}\right)^5-13\left(\frac{1\cdot 3\cdot 5}{2\cdot 4\cdot 6}\right)^5+...=\frac{2}{\left[\Gamma\left(\frac{3}{4}\right)\right]^4} \tag{4}$$

$$\int_0^\infty \frac{1+\left(\frac{x}{b+1}\right)^2}{1+\left(\frac{x}{a}\right)^2}\cdot\frac{1+\left(\frac{x}{b+2}\right)^2}{1+\left(\frac{x}{a+1}\right)^2}\,...\,dx=\frac{1}{2}\pi^{\frac{1}{2}}\cdot\frac{\Gamma\left(a+\frac{1}{2}\right)\Gamma\left(b+1\right)\Gamma\left(b-a+\frac{1}{2}\right)}{\Gamma\left(a\right)\Gamma\left(b+\frac{1}{2}\right)\Gamma\left(b-a+1\right)} \tag{5}$$

$$\int_0^\infty \frac{dx}{(1+x^2)(1+r^2x^2)(1+r^4x^2)...}=\frac{\pi}{2(1+r+r^3+r^6+r^{10}+...)} \tag{6}$$

$$\text{Si } \alpha\beta=\pi^2\text{, alors } \alpha^{-\frac{1}{4}}\left(1+4\alpha\int_0^\infty\frac{xe^{-\alpha x^2}}{e^{2\pi x}-1}\,dx\right)=\beta^{-\frac{1}{4}}\left(1+4\beta\int_0^\infty\frac{xe^{-\beta x^2}}{e^{2\pi x}-1}\,dx\right) \tag{7}$$

$$\int_0^a e^{-x^2}\,dx=\frac{1}{2}\pi^{\frac{1}{2}}-\cfrac{e^{-a^2}}{2a+\cfrac{1}{a+\cfrac{2}{2a+\cfrac{3}{a+\cfrac{4}{2a+...}}}}} \tag{8}$$

$$4\int_0^\infty \frac{xe^{-x\sqrt{5}}}{\cosh x}\,dx=\cfrac{1}{1+\cfrac{1^2}{1+\cfrac{1^2}{1+\cfrac{2^2}{1+\cfrac{2^2}{1+\cfrac{3^2}{1+\cfrac{3^2}{1+...}}}}}}} \tag{9}$$

$$\text{Si } u=\cfrac{x}{1+\cfrac{x^5}{1+\cfrac{x^{10}}{1+\cfrac{x^{15}}{1+...}}}}\text{ et } v=\cfrac{x^{\frac{1}{5}}}{1+\cfrac{x}{1+\cfrac{x^2}{1+\cfrac{x^3}{1+...}}}}\text{, alors } v^5=u\frac{1-2u+4u^2-3u^3+u^4}{1+3u+4u^2+2u^3+u^4} \tag{10}$$

$$\cfrac{1}{1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-4\pi}}{1+...}}}=\left[\sqrt{\frac{5+\sqrt{5}}{2}}-\frac{\sqrt{5}+1}{2}\right]e^{\frac{2}{5}\pi} \tag{11}$$

$$\cfrac{1}{1+\cfrac{e^{-2\pi\sqrt{5}}}{1+\cfrac{e^{-4\pi\sqrt{5}}}{1+...}}}=\left[\frac{\sqrt{5}}{1+\sqrt[5]{5^{\frac{3}{4}}\left(\frac{\sqrt{5}-1}{2}\right)^{\frac{5}{2}}-1}}-\frac{\sqrt{5}+1}{2}\right]e^{\frac{2\pi}{\sqrt{5}}} \tag{12}$$