Class 3: Relation between Beta and Gamma functions and Duplication formula.

1. Prove that $\beta\left(-\dfrac{1}{2},\dfrac{5}{2}\right)=-\dfrac{3}{2}\pi$

2. Prove that $\displaystyle\int_{0}^{\infty}\dfrac{xdx}{1+x^{6}}=\dfrac{\pi}{3}$

3. Evaluate $\displaystyle\int_{-1}^{1}\left(\dfrac{1+x}{1-x}\right)^{\frac{1}{2}}dx$ Ans: π

4. Show that $\displaystyle\int_{1}^{3}\dfrac{dx}{\sqrt{(x-1)(3-x)}}$ Ans: π

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