

计算下列定积分:

1. $\int_0^{\frac{\pi}{2}} e^{\sin x} \cos x dx.$

2. $\int_0^a x\sqrt{a^2-x^2} dx.$

3. $\int_{\ln 2}^{2\ln 2} \frac{1}{\sqrt{e^x-1}} dx.$

4. $\int_0^1 \frac{1}{1+e^x} dx.$

5. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x \cos 2x dx.$

6. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x(\sin x + \cos x) dx.$

7. $\int_{-1}^1 |x| dx.$

8. $\int_{-1}^1 (xe^{-x} + \frac{x^3}{1+x^2}) dx.$