

次の定積分を求めよ。

$$(1) \int_0^1 x\sqrt{1-x} dx$$

$$(2) \int_{-a}^a \sqrt{a^2-x^2} dx$$

$$(3) \int_0^{\frac{\sqrt{3}}{2}} \frac{dx}{\sqrt{1-x^2}}$$

$$(4) \int_0^1 \frac{dx}{1+x^2}$$

$$(5) \int_{-\sqrt{3}}^{\sqrt{3}} \frac{dx}{x^2+9}$$

$$(6) \int_0^{\sqrt{3}} \frac{t^2}{(1+t^2)^2} dt$$

$$(7) \int_0^1 xe^{x^2} dx$$

$$(8) \int_1^2 \frac{dx}{x^2-2x+2}$$

$$(9) \int_3^4 \frac{dx}{\sqrt{4x-x^2}}$$