Integration by Substitution

Find the anti-derivative:

1. $\int \frac{e^{\frac{1}{x}}}{x^2}\, dx$

2. $\int \sqrt{1 + 2x}\, dx$

3. $\int \left(2x^{\frac{3}{2}} + 1\right)\sqrt{x}\, dx$

Evaluate the definite integral:

4. $\int_1^4 \frac{1}{\sqrt{x}\left(\sqrt{x}+1\right)^2}\, dx$

5. $\int_0^\pi \cos x \cdot \sqrt{\sin x}\, dx$