Integrate using the substitution provided:

> These questions are more difficult than those asked in exam.

1. $$\int \frac{1}{a^2+x^2}, dx \quad [\text{Use } x = a\tan(\theta)] = \frac{1}{a}\arctan\left(\frac{x}{a}\right) + C$$
2. $$\int \frac{1}{\sqrt{a^2-x^2}}, dx \quad [\text{Use } x = a\sin(\theta)] = \arcsin\left(\frac{x}{a}\right) + C$$
3. $$\int \frac{1}{\sqrt{x^2+a^2}}, dx \quad [\text{Use } x = a\tan(\theta)] = \ln\left|x + \sqrt{x^2+a^2}\right| + C$$

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