Integration Techniques

In each problem, decide which method of integration you would use. If you would use substitution, what would u be? If you would use integration by parts, what would u and dv be? If you would use partial fractions, what would the partial fraction expansion look like? (Don't solve for the coefficients.)

1. $\displaystyle \int \frac{\cos x \; dx}{\sqrt{1 + \sin x}}$.

2. $\displaystyle \int (\ln x)^2 \; dx$.

3. $\displaystyle \int e^x \sin x \; dx$.

4. $\displaystyle \int \frac{x}{x^2 - 1} \; dx$.

5. $\displaystyle\int xe^{x^2}\ dx.$

6. $\displaystyle\int \frac{x^2}{x^2 + 4x + 3}\ dx.$

7. $\displaystyle\int \frac{e^t}{1 + e^t}\ dt.$

8. $\displaystyle\int \arcsin x\ dx.$