Activity - Using Integral Tables and CAS

Part 1.

For each of the following integrals, evaluate the integral using u-substitution and/or an entry from an integral table.

(a) $\displaystyle\int \sqrt{x^2 + 4}\, dx$

(b) $\displaystyle\int \frac{x}{\sqrt{x^2 + 4}}\, dx$

(c) $\displaystyle\int \frac{2}{\sqrt{16 + 25x^2}}\, dx$

(d) $\displaystyle\int \frac{1}{x^2 \sqrt{49 - 36x^2}}\, dx$

Part 2.

For each of the following integrals, evaluate the integral using a computer algebra system. Compare your answers to those obtained in Part 1. If there are any differences in the two answers, explain why.

(a) $\displaystyle\int \sqrt{x^2 + 4}\, dx$

(b) $\displaystyle\int \frac{x}{\sqrt{x^2 + 4}}\, dx$

(c) $\displaystyle\int \frac{2}{\sqrt{16 + 25x^2}}\, dx$

(d) $\displaystyle\int \frac{1}{x^2 \sqrt{49 - 36x^2}}\, dx$

Part 3.

Choose one of the integrals in Part 1 where you evaluated using a table and solve it by hand using an integration technique that you've learned. Compare your answer with the answer obtained in Part 1.