Summary of Integration by Partial Fractions

To compute \( \int \frac{P(x)}{Q(x)} \, dx \) by partial fractions:

1. If \( \deg(P(x)) \geq \deg(Q(x)) \) then do long division.
2. Factor \( Q(x) \).
3. Categorize factors and write out partial fractions, e.g.

\[
\frac{P(x)}{(x+1)(x-2)^3(x^2+2)(x^2+3)^2} = \frac{A}{x+1} + \frac{B}{x-2} + \frac{C}{(x-2)^2} + \frac{D}{(x-2)^3} + \frac{Ex+F}{x^2+2} + \frac{Gx+H}{x^2+3} + \frac{Ix+J}{(x^2+3)^2}
\]

4. Solve for constants.
5. Integrate each partial fraction separately.