Evaluate \( \int \frac{2}{x^2 + 6x + 15} \, dx \).

Notice that
\[
x^2 + 6x + 15 = x^2 + 6x + 9 + 6 = (x + 3)^2 + 6
\]
so the quadratic denominator is irreducible. Then we rewrite the fraction as
\[
\frac{2}{x^2 + 6x + 15} = \frac{2/6}{(x+3)^2 + 1}
\]
Using this and the substitution \( u = (x + 3)/\sqrt{6} \), we obtain
\[
\int \frac{2}{x^2 + 6x + 15} \, dx = \int \frac{1/3}{(x+3)^2/\sqrt{6} + 1} \, dx
\]
\[
= \int \frac{\sqrt{6}/3}{u^2 + 1} \, du
\]
\[
= \frac{\sqrt{6}}{3} \arctan u + C
\]
\[
= \frac{\sqrt{6}}{3} \arctan \left( \frac{x + 3}{\sqrt{6}} \right) + C
\]

Evaluate \( \int \frac{5}{x^2 - 4x + 8} \, dx \).

Notice that
\[
x^2 - 4x + 8 = x^2 - 4x + 4 + 4 = (x - 2)^2 + 4
\]
so the quadratic denominator is irreducible. Then we rewrite the fraction as
\[
\frac{5}{x^2 - 4x + 8} = \frac{5/4}{(x-2)^2 + 1}
\]
Using this and the substitution \( u = (x - 2)/2 \), we obtain
\[
\int \frac{5}{x^2 - 4x + 8} \, dx = \int \frac{5/4}{(x-2)^2/4 + 1} \, dx
\]
\[
= \int \frac{5/2}{u^2 + 1} \, du
\]
\[
= \frac{5}{2} \arctan u + C
\]
\[
= \frac{5}{2} \arctan \left( \frac{x - 2}{2} \right) + C
\]