

1. Use partial fractions to evaluate $\int \frac{x+5}{x^2-5x+4} dx$.

2. Compute $\int \frac{1}{x^2-9} dx$.

3. Evaluate $\int \frac{x^3}{x-4} dx$. Hint: Use polynomial long division to simplify first.

4. Evaluate $\int \frac{4x^2-9x+4}{x(x-2)(x-1)} dx$.

5. Compute $\lim_{x \rightarrow 2} \frac{x^2 + 3x - 10}{x - 2}$.

6. Compute $\lim_{x \rightarrow \pi} \frac{x - \pi}{\sin x}$.

7. Find $\lim_{x \rightarrow 0^+} \left(\frac{12}{x} - \frac{5}{x^2} \right)$.

8. Find $\lim_{x \rightarrow \infty} x^{1/x}$. Hint: Let $A = \lim_{x \rightarrow \infty} x^{1/x}$ and take the natural log of both sides.

9. Which function grows faster as $x \rightarrow \infty$, $f(x) = \ln(x^2)$ or $g(x) = \sqrt{x}$? Use L'Hospital's rule to find out.
