2.3-Analytic Computation of Limits

Properties of Limits See pp 91-93. Basis for the techniques used in the following examples.

Use the properties to compute $\lim_{x\to 5} x^2 + -4x + 3$.

Compute $\lim_{x\to -1} \dfrac{x^2+6x+5}{x^2-3x-4}$

Compute $\lim_{y\to 9} \dfrac{\sqrt{y}-3}{y-9}$

Compute $\lim_{x \to 3^-} \dfrac{1}{|x-3|}$

Limits of Vector Functions:

Compute $\lim_{t \to 1} \mathbf{r}(t)$, where $\mathbf{r}(t) = \left(\dfrac{t^2 + 2t}{t+1} \right) \mathbf{i} + \left(\dfrac{t^4 - 1}{t-1} \right) \mathbf{j}$.

Squeeze Theorem: If $g(x) \leq f(x) \leq h(x)$ and $\lim_{x \to a} g(x) = \lim_{x \to a} h(x) = L$, then

Example: Compute $\lim_{x \to 0} x^4 \cos\left(\dfrac{1}{x}\right)$

On Your Own: 2.3 #15-21,27,29,31,34,36,39-42,45,48,54-56,66-68,71,81