

$$\begin{aligned}
29. \quad & \lim_{x \rightarrow -\infty} [x + \sqrt{x^2 - 4x + 1}] \\
&= \lim_{x \rightarrow -\infty} \frac{x^2 - (x^2 - 4x + 1)}{x - \sqrt{x^2 - 4x + 1}} \\
&= \lim_{x \rightarrow -\infty} \frac{4x - 1}{x - |x|\sqrt{1 - (4/x) + (1/x^2)}} \\
&= \lim_{x \rightarrow -\infty} \frac{x[4 - (1/x)]}{x + x\sqrt{1 - (4/x) + (1/x^2)}} \\
&= \lim_{x \rightarrow -\infty} \frac{4 - (1/x)}{1 + \sqrt{1 - (4/x) + (1/x^2)}} = 2.
\end{aligned}$$

Note how we have used  $|x| = -x$  (in the second last line), because  $x \rightarrow -\infty$ .