Compute each of the limits below. Show your work.

Comment: If you leave off the \( \lim_{x \to a} \) part of the expression before you have evaluated the limit, then you are making a mistake. For example,

\[
\lim_{h \to 0} \frac{(2 + h)^2 - 4}{h} \neq \frac{4 + 4h + h^2 - 4}{h}
\]

because the expression on the left has a fixed numerical value (4, in this case), while the expression on the right is a function whose value varies with \( h \).

a. (2 pts) \( \lim_{x \to 0} \frac{x^2 - 4x - 3}{x + 1} = \frac{\lim_{x \to 0} x^2 - 4x - 3}{\lim_{x \to 0} x + 1} = \ldots \)

(because the limit of the denominator is not 0)

\[
\ldots = \frac{0^2 - 4 \cdot 0 - 3}{0 + 1} = -3.
\]

b. (3 pts) \( \lim_{h \to 0} \frac{(2 + h)^2 - 4}{h} = \lim_{h \to 0} \frac{4 + 4h + h^2 - 4}{h} = \lim_{h \to 0} \frac{h(4 + h)}{h} = \lim_{h \to 0} 4 + h = 4 + 0 = 4. \)
c. (2 pts) \( \lim_{t \to 0^+} \frac{t}{|t|} = \lim_{t \to 0^+} \frac{t}{t} = \lim_{t \to 0^+} 1 = 1, \)

because for \( t > 0, |t| = t. \)

d. (3 pts) \( \lim_{x \to \infty} \frac{x - 1}{x^2 - 4x + 3} = \lim_{x \to \infty} \frac{x}{x^2} = \lim_{x \to \infty} \frac{1}{x} = 0 \)

because as \( x \to \infty \) both the numerator and denominator are dominated by their highest degree terms.