Problem 1: Calculate \( \lim_{x \to -2} \frac{x^2 - 4}{x^2 + 3x + 2} \).

Solution of problem 1:
\[
\lim_{x \to -2} \frac{x^2 - 4}{x^2 + 3x + 2} = \lim_{x \to -2} \frac{(x - 2)(x + 2)}{(x + 2)(x + 1)} = \lim_{x \to -2} \frac{x - 2}{x + 1} = \frac{-2 - 2}{-2 + 1} = \frac{4}{3}.
\]

Problem 2 Find the Cartesian equation of the curve given by parametric equations
\[
x = \sqrt{t} + 1, \quad y = -t + 1, \quad t \geq 1.
\]
Sketch it, and indicate with an arrow the direction in which the curve is traced as the parameter increases.

Solution of problem 2:
\[
x = \sqrt{t} + 1 \quad \Rightarrow \quad \sqrt{t} = x - 1 \quad \Rightarrow \quad t = (x - 1)^2, \quad x \geq 1
\]
Hence, \( y = -t + 1 = -(x - 1)^2 + 1 \). Thus the Cartesian equation of the curve \( x = \sqrt{t} + 1, \ y = -t + 1 \) is \( y = -(x - 1)^2 + 1, \ x \geq 1 \). We now have to take into account the restriction \( t \geq 1 \), which is the same as \( x \geq 2 \). Hence, the Cartesian equation of the given curve is
\[
y = -(x - 1)^2 + 1, \quad x \geq 2.
\]
The graph of the function \( y = -(x - 1)^2 + 1 \) is the upside down parabola with vertex at \((1, 1)\). Hence our curve is the part of the parabola, which contains only the points whose \( x \)-coordinate is greater or equal to 2:

Since \( x \) is increasing as \( t \) is increasing the arrow is directed to the south-east.