33. By Exercise 35, $y = -1$ is a horizontal asymptote (at the right) of $y = \dfrac{1}{\sqrt{x^2 - 2x} - x}$. Since

$$\lim_{x \to -\infty} \frac{1}{\sqrt{x^2 - 2x} - x} = \lim_{x \to -\infty} \frac{1}{|x|(\sqrt{1 - (2/x)} + 1} = 0,$$

$y = 0$ is also a horizontal asymptote (at the left).
Now $\sqrt{x^2 - 2x} - x = 0$ if and only if $x^2 - 2x = x^2$, that is, if and only if $x = 0$. The given function is undefined at $x = 0$, and where $x^2 - 2x < 0$, that is, on the interval $[0, 2]$. Its only vertical asymptote is at $x = 0$, where $\lim_{x \to 0-} \dfrac{1}{\sqrt{x^2 - 2x} - x} = \infty$.