1. Find the average rate of change of \( y = \sqrt{2x-1} \) between \( x = 1 \) and \( x = 5 \).

   Solution. The average rate of change of \( y = f(x) \) between \( x = a \) and \( x = b \) is
   \[
   \frac{f(b) - f(a)}{b - a}
   \]
   and so we have
   \[
   \frac{\sqrt{2 \cdot 5 - 1} - \sqrt{2 \cdot 1 - 1}}{5 - 1} = \frac{\sqrt{9} - \sqrt{1}}{4} = \frac{2}{4} = \frac{1}{2}
   \]
   So the average rate of change is \( \frac{1}{2} \).

2. Sketch the graph of \( y = \frac{1 - 2x}{5x - 20} \) including \( x \) and \( y \) intercepts and horizontal and vertical asymptotes.

   Solution. First, we observe that \( 5x - 20 = 0 \) exactly when \( x = 4 \), and when \( x = 4 \), the numerator, \( 1 - 2x \), is \( -7 \neq 0 \), so there is a vertical asymptote at \( x = 4 \).
   Next,
   \[
   \lim_{x \to \infty} \frac{1 - 2x}{5x - 20} = \lim_{x \to \infty} \frac{1/x - 2}{5 - 20/x} = \frac{-2}{5}
   \]
   so there is one horizontal asymptote, at \( y = -2/5 \).
   To find the \( y \)-intercept, we let \( x = 0 \), to get \( y = 1/-20 \) and to find the \( x \)-intercept, we set \( y = 0 \), that is, solve
   \[
   0 = \frac{1 - 2x}{5x - 20}, \quad 0 = 1 - 2x, \quad 2x = 1,
   \]
   which gives \( x = 1/2 \).