

$$1) y = \log(x^2 - 2x) \rightarrow x^2 - 2x > 0 \rightarrow x(x-2) > 0 \rightarrow \frac{0}{+} \frac{-}{-} \frac{+}{+} \rightarrow DF = (-\infty, 0) \cup (2, \infty)$$

$$2) y = \log|x-1| \rightarrow \begin{cases} 1) |x-1| > 0 \rightarrow x \neq 1 \rightarrow -\infty < x < \infty \\ 2) |x-1| > 0 \rightarrow |x| > 1 \rightarrow x > 1 \text{ or } x < -1 \\ 3) |x-1| \neq 1 \rightarrow |x| \neq 2 \rightarrow x \neq \pm 2 \end{cases} DF = (-\infty, -2) \cup (-2, -1) \cup (-1, 1) \cup (1, 2) \cup (2, \infty)$$

$$3) y = \log \frac{x^2 - 2x + 1}{x-1} \rightarrow \begin{cases} 1) \frac{x^2 - 2x + 1}{x-1} > 0 \rightarrow \frac{(x-1)(x-1)}{x-1} > 0 \rightarrow \frac{x-1}{x-1} > 0 \rightarrow x > 1 \\ 2) x-1 \neq 0 \rightarrow x \neq 1 \end{cases} DF = (1, \infty)$$

$$4) y = \sqrt{x^2 - 11x + 21} + \log \frac{\sqrt{x^2 - 11x + 21}}{x} \rightarrow \begin{cases} 1) x^2 - 11x + 21 > 0 \rightarrow (x-3)(x-7) > 0 \rightarrow x < 3 \text{ or } x > 7 \\ 2) x^2 - 11x + 21 > 0 \rightarrow x^2 > 11x - 21 \rightarrow x < 11 \\ 3) x > 0 \end{cases} DF = (0, 3] \cup [7, \infty)$$

$$5) y = \frac{x^2 - x}{x^2 + x} \rightarrow y = \frac{x(x-1)}{x(x+1)} \rightarrow \begin{matrix} -1 & 0 & 1 \\ + & - & + \end{matrix}$$

$x^2 - x$	+	+	0	-	0	+
$x^2 + x$		0	0			
x						

$$6) y = \sqrt{\frac{x - f(x)}{f(x)}} \rightarrow \frac{x - f(x)}{f(x)} \geq 0 \rightarrow \frac{-x - 1}{-x + 1} \geq 0 \rightarrow \begin{cases} 1) x - f(x) = 0 \rightarrow f(x) = x \rightarrow x = 0 \\ 2) f(x) \neq 0 \rightarrow x \neq \pm 1 \end{cases} DF = (-1, 1) \cup (1, \infty)$$

