

$$f(x) = \ln\left(\frac{x+1}{x-4}\right) \quad D_f = ]-\infty, -1[ \cup ]4, +\infty[ \quad \textcircled{9}$$

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

$$\lim_{x \rightarrow -1^-} f(x) = \ln\left(\frac{0}{-5}\right) =$$

$$\lim_{x \rightarrow 4^+} f(x) = \ln\left(\frac{5}{0^+}\right) =$$

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$$f(x) = \frac{1}{x}(\ln x - 1) \quad D_f = ]0, +\infty[ \quad \textcircled{10}$$

$$\lim_{x \rightarrow 0^+} f(x) = \frac{1}{0^+}(\ln 0^+ - 1) = (+\infty)(-\infty) =$$

$$\lim_{x \rightarrow +\infty} f(x) = 0(+\infty) \quad (\text{عدم تعيين})$$

$$f(x) = \frac{\ln x}{x} - \frac{1}{x}$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

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$$f(x) = x + \ln(x+1) - \ln x \quad D_f = ]0, +\infty[ \quad \textcircled{12}$$

$$\lim_{x \rightarrow 0^+} f(x) = 0 + 0 - (-\infty) =$$

$$\lim_{x \rightarrow +\infty} f(x) = +\infty - \infty \quad (\text{حالة عدم تعيين})$$

$$f(x) = x + \ln\left(\frac{x+1}{x}\right)$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

$$f(x) = \frac{1}{x} - \ln x \quad D_f = ]0, +\infty[ \quad \textcircled{5} \quad \left(\frac{1}{165}\right)$$

$$\lim_{x \rightarrow 0^+} f(x) = +\infty - (-\infty) =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

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$$f(x) = \frac{x \cdot \ln x}{x+1} \quad D_f = ]0, +\infty[ \quad \textcircled{6}$$

$$\lim_{x \rightarrow 0^+} f(x) = \frac{0 \cdot (-\infty)}{1} =$$

$$\lim_{x \rightarrow +\infty} f(x) = \frac{\infty}{\infty} \quad (\text{عدم تعيين})$$

$$f(x) = \frac{x \cdot \ln x}{x \left( \begin{array}{c} + \\ - \end{array} \right)}$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

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$$f(x) = \frac{1}{\ln x} \quad D_f = ]0, 1[ \cup ]1, +\infty[ \quad \textcircled{7}$$

$$\lim_{x \rightarrow 0^+} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) = \frac{1}{0^-} =$$

$$\lim_{x \rightarrow 1^+} f(x) = \frac{1}{0^+} =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

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$$f(x) = x(1 - \ln x) \quad D_f = ]0, +\infty[ \quad \textcircled{8}$$

$$\lim_{x \rightarrow +\infty} f(x) = 0(1 + \infty) \quad (\text{عدم تعيين})$$

$$f(x) = x - x \cdot \ln x$$

$$\lim_{x \rightarrow 0^+} f(x) =$$

$$\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} x(1 - \ln x) = +\infty(1 + \infty) =$$

$$f(x) = x + x - \ln\left(1 + \frac{1}{x}\right)$$

④

التابع  $f$  معرف لما  $1 + \frac{1}{x} > 0$

و بتوحيد المقامات نجد:  $\frac{x+1}{x} > 0$

$x$	$-\infty$	$-1$	$0$	$+\infty$
$x+1$	-	0	+	+
$x$	-	-	0	+
الكسر	+	0	-	+
المتراجحة	م			م

$$D_f = ]-\infty, -1[ \cup ]0, +\infty[$$

$$f(x) = x \left[ 1 + \ln\left(1 + \frac{1}{x}\right) \right]$$

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

$$\lim_{x \rightarrow -1} f(x) = \lim \left[ x + x \ln\left(1 + \frac{1}{x}\right) \right]$$

$$= -1 + (-1) \ln(1-1) =$$

$$\lim_{x \rightarrow 0^+} f(x) = \lim \left[ x + x \ln\left(1 + \frac{1}{x}\right) \right]$$

$$\lim_{x \rightarrow +\infty} f(x) = 0 + 0(+\infty) \quad (\text{عدم تعيين})$$

$$f(x) = x + x \ln\left(\frac{x+1}{x}\right)$$

$$= x + x [\ln(x+1) - \ln x]$$

$$= x + x \cdot \ln(x+1) - x \cdot \ln x$$

$$\lim_{x \rightarrow 0^+} f(x) =$$

فيما يأتي، جد نهاية التابع  $f$  عند أطراف مجالات تعريفه  $\left(\frac{2}{165}\right)$

$$f(x) = \frac{\ln x}{x} \quad D_f = ]0, +\infty[ \quad \text{①}$$

$$\lim_{x \rightarrow 0^+} f(x) = \frac{-\infty}{0^+} = -\infty$$

$$\lim_{x \rightarrow +\infty} f(x) = 0$$

$$f(x) = \frac{x - \ln x}{x} \quad D_f = ]0, +\infty[ \quad \text{②}$$

$$\lim_{x \rightarrow 0^+} f(x) = \frac{0 - (-\infty)}{0^+} = +\infty$$

$$\lim_{x \rightarrow +\infty} f(x) = \frac{+\infty - \infty}{\infty} \quad (\text{عدم تعيين})$$

$$f(x) = \frac{x \left( \frac{-}{-} \right)}{x} =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

$$f(x) = x - \ln x \quad D_f = ]0, +\infty[ \quad \text{③}$$

$$\lim_{x \rightarrow 0^+} f(x) = 0 - ( ) =$$

$$\lim_{x \rightarrow +\infty} f(x) = +\infty - \infty \quad (\text{عدم تعيين})$$

$$f(x) = x \left( \frac{-}{-} \right)$$

$$\lim_{x \rightarrow +\infty} f(x) =$$