Solution

Laplace Inverse Transform of $\frac{195}{157.89e^{-0.42x}+1}+\frac{103.09}{102.58e^{-0.48x}+1}$:

No solution in terms of standard functions

Steps

$$L^{-1}\left\{\frac{195}{157.89e^{-0.42x}+1}+\frac{103.09}{102.58e^{-0.48x}+1}\right\}$$

$$\lim_{x\to\infty}\left(\frac{195}{1+157.89e^{-0.42x}}+\frac{103.09}{1+102.58e^{-0.48x}}\right)=298.09$$

Hide Steps

$$\lim_{x\to\infty}\left(\frac{195}{1+157.89e^{-0.42x}}+\frac{103.09}{1+102.58e^{-0.48x}}\right)$$

$$\lim_{x\to a}\left[f(x)\pm g(x)\right]=\lim_{x\to a}f(x)\pm\lim_{x\to a}g(x)$$

With the exception of indeterminate form

$$=\lim_{x\to\infty}\left(\frac{195}{1+157.89e^{-0.42x}}\right)+\lim_{x\to\infty}\left(\frac{103.09}{1+102.58e^{-0.48x}}\right)$$

$$\lim_{x\to\infty}\left(\frac{195}{1+157.89e^{-0.42x}}\right)=195$$

Hide Steps

$$\lim_{x\to\infty}\left(\frac{195}{1+157.89e^{-0.42x}}\right)$$

$$\lim_{x\to a}\left[c\cdot f(x)\right]=c\cdot\lim_{x\to a}f(x)$$

$$=195\cdot\lim_{x\to\infty}\left(\frac{1}{1+157.89e^{-0.42x}}\right)$$

$$\lim_{x\to a}\left[\frac{f(x)}{g(x)}\right]=\frac{\lim_{x\to a}f(x)}{\lim_{x\to a}g(x)},\quad \lim_{x\to a}g(x)\neq 0$$

With the exception of indeterminate form

$$=195\cdot\frac{\lim_{x\to\infty}(1)}{\lim_{x\to\infty}\left(1+157.89e^{-0.42x}\right)}$$

$$\lim_{x\to\infty}(1)=1$$

$$\lim_{x\to\infty}(1)$$

$\lim_{x\to a} c = c$

$= 1$

$\lim_{x\to\infty}\left(1+157.89e^{-0.42x}\right)=1$ Hide Steps

$\lim_{x\to\infty}\left(1+157.89e^{-0.42x}\right)$

$\lim_{x\to a}\left[f(x)\pm g(x)\right]=\lim_{x\to a}f(x)\pm\lim_{x\to a}g(x)$

With the exception of indeterminate form

$=\lim_{x\to\infty}(1)+\lim_{x\to\infty}\left(157.89e^{-0.42x}\right)$

$\lim_{x\to\infty}(1)=1$ Hide Steps

$\lim_{x\to\infty}(1)$

$\lim_{x\to a} c = c$

$= 1$

$\lim_{x\to\infty}\left(157.89e^{-0.42x}\right)=0$ Hide Steps

$\lim_{x\to\infty}\left(157.89e^{-0.42x}\right)$

$\lim_{x\to a}\left[c\cdot f(x)\right]=c\cdot\lim_{x\to a}f(x)$

$=157.89\cdot\lim_{x\to\infty}\left(e^{-0.42x}\right)$

Apply the Limit Chain Rule: 0 Show Steps

$=157.89\cdot 0$

Simplify

$=0$

$=1+0$

Simplify

$=1$

$=195\cdot\frac{1}{1}$

Simplify

$=195$

$\lim_{x\to\infty}\left(\frac{103.09}{1+102.58e^{-0.48x}}\right)=103.09$

Hide Steps

$\lim_{x\to\infty}\left(\frac{103.09}{1+102.58e^{-0.48x}}\right)$

$\lim_{x\to a}\left[c\cdot f(x)\right]=c\cdot\lim_{x\to a}f(x)$

$=103.09\cdot\lim_{x\to\infty}\left(\frac{1}{1+102.58e^{-0.48x}}\right)$

$\lim_{x\to a}\left[\frac{f(x)}{g(x)}\right]=\frac{\lim_{x\to a}f(x)}{\lim_{x\to a}g(x)},\quad \lim_{x\to a}g(x)\neq 0$

With the exception of indeterminate form

$=103.09\cdot\frac{\lim_{x\to\infty}(1)}{\lim_{x\to\infty}\left(1+102.58e^{-0.48x}\right)}$

$\lim_{x\to\infty}(1)=1$

Show Steps

$\lim_{x\to\infty}\left(1+102.58e^{-0.48x}\right)=1$

Show Steps

$=103.09\cdot\frac{1}{1}$

Simplify

$=103.09$

$=195+103.09$

Simplify

$=298.09$

Since $298.09\neq 0$

= No solution in terms of standard functions