Find the Laplace transform of \displaystyle f(t) =-2+  \frac{t^5}{20} +\sin(3 t).   
  
\displaystyle L(f)(s)  =

Find the Laplace transform of \displaystyle f(t) = \left(t+1\right)^{2}.   
  
\displaystyle L(f)(s)  =

Find the Laplace transform of \displaystyle f(t) =  4\cos\!\left(2t\right)+3e^{2t}.   
  
\displaystyle L(f)(s)  =

Find the Laplace transform of \displaystyle f(t) =      \begin{cases} (t-1), & 0\leq t<1 \\ 0, &  t\geq 1\end{cases}  
  
\displaystyle L(f)(s)  =

Find the Laplace transform of \displaystyle f(t) =     \begin{cases} 1, & 0\leq t<2 \\ (t-2), & t\geq 2\end{cases}  
  
\displaystyle L(f)(s)  =

Find the inverse Laplace transform of

\frac{s-6}{s^{2}+9} \hspace{0.5in} s > 0

y(t)=.

Find the inverse Laplace transform of

\frac{9 s +4}{s^2 - 49} \hspace{0.5in} s > 7

y(t)=

Find the inverse Laplace transform of

\frac{s^{3}+s^{2}+s+9 }{(s^2+1) (s^2 + 9)} \hspace{0.5in} s>0

y(t)=

Consider the following initial value problem:

y'' -{3} y' - {28} y= \sin(8 t) \hspace{0.5in} y(0)=5, \; y'(0)=1

Using Yfor the Laplace transform of y(t), i.e., Y = \mathcal{L} \lbrace y(t) \rbrace, find the equation you get by taking the Laplace transform of the differential equation and solve for   
  
Y(s) =

Find the Laplace transform of

f(t) =   t^{4} e^{-2t}

\displaystyle L(f)(s)  =

Find the Laplace transform of

f(t) =     e^{2t}\sin(5t)  +  e^{2t}\cos(5t)  
  
\displaystyle L(f)(s)  =

Find the inverse Laplace transform of

F(s) =   \frac{3s-1}{\left(s-2\right)^{2}+1 }

\displaystyle f(t)  =

Find the Laplace transform of

f(t) = 1 u (t- 5 ) + 4 u (t-8) + 5 u (t-10)

F(s)=.

Take the Laplace transform of the following initial value problem and solve for Y(s) = \mathcal{L}\lbrace y(t) \rbrace:

(D^{2}-4D+5) y= 5 \hspace{0.5in} y(0)=0, \; y'(0)=0

Y(s)=.   
  
Now find the inverse transform to find y(t) =

Find the Laplace transform of

f(t) =     t^2 \cos(2t)

\displaystyle L(f)(s)  =

Find the convolution of f(t) = 1and g(t) = \sin\!\left(t\right)  
  
  (f\ast g)(t)  =  

y''+ 4 y = 2 \delta(t-3),\ \ y(0)=1,\ \ y'(0)=2

Let Y(s)denote the Laplace transform of y. Find Y(s).   
  
\displaystyle Y(s) =  
  
Now find the inverse Laplace transform to obtain y(t)  
  
\displaystyle y(t)  =  
  
*NOTE:* Your answer will require the unit [step](http://webwork.math.ttu.edu/webwork2/s113mtodam3350sD01/HW6/18/?effectiveUser=moshahid&displayMode=images&showOldAnswers=1&user=moshahid&key=chV6GnJkoizIcJjSxoQacVHVsGvt8s7Q) function   \displaystyle u(t)= \begin{cases} 0,& t<0\\1,& t\geq 0\end{cases}  which in

Evaluate the integral (here \delta(t)is the Dirac delta function)

\int_{-\infty}^{\infty} e^{3t} \delta(t)\, dt

  ANS:   

Find the Laplace transform F(s)of the given function f(t)

f(t) = 3\delta(t-1)