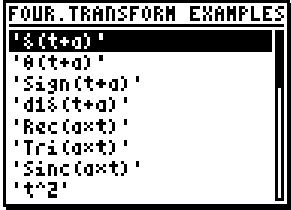
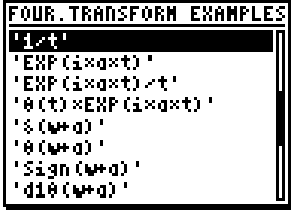


FOURTRF

<p>Ftrex: Fourier transform examples</p> <p>second example (12s)</p>		
<p>t->w: Fourier transform for piece wise functions (21s)</p> <p>second example (12s)</p>	$\left\{ \frac{t}{a^2} + \frac{1}{a} \frac{-t+1}{a^2} \right\}$ $\frac{(-a \ 0 \ a)}{a^2 \cdot w^2}$ $\frac{-((\cos(w \cdot a) - 1) \cdot 2)}{a^2 \cdot w^2}$ <p>Ftrex t-w w-t Fob+ Frul+ NRsin</p>	$\frac{(-a \ a)}{(-T \ 0 \ T)}$ $\frac{a(i \cdot \cos(w \cdot T) - 1) \cdot 2}{w}$ <p>Ftrex t-w w-t Fob+ Frul+ NRsin</p>
<p>t->w: Fourier transform (8s)</p> <p>θ=Heaviside Unitstep</p> <p>δ=Dirac Delta</p>	$\frac{\delta(t+a)}{1 \cdot w \cdot a}$ $\frac{e^{\theta(t+a)}}{1 \cdot w \cdot a}$ $\frac{w \cdot \pi \cdot \delta(w) - i \cdot e}{w}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>	$\frac{\text{Sign}(t+a)}{-[e^{i \cdot w \cdot a} \cdot 2 \cdot i]}$ $\frac{d1\delta(t+a)}{w \cdot e^{i \cdot w \cdot a} \cdot i}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>
<p>t->w: Fourier transform (5-10s)</p> <p>Rec: rectangular pulse</p> <p>Tri: triangular pulse</p> <p>Sinc: SIN(t)/t</p>	$\frac{\text{Rec}\left(\frac{t}{T}\right)}{T \cdot \text{Sinc}\left(\frac{wT}{2 \cdot \pi}\right)}$ $\frac{\text{Tri}(a \cdot t)}{\text{Sinc}\left(\frac{w}{2 \cdot \pi \cdot a}\right)^2}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>	$\frac{\text{Sinc}(a \cdot t)}{a^2 \cdot \text{Rec}\left(\frac{w}{2 \cdot a \cdot \pi}\right)}$ $\frac{t^2}{-(\pi \cdot d1d1\delta(w) \cdot 2)}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>
<p>t->w: Fourier transform (10s)</p> <p>NRsimp: non rigorous simplify(2.5s)</p>	$\frac{1}{t^3}$ $\frac{w^2 \cdot \ln \text{Sign}(w \cdot i)}{2}$ $\frac{e^{i \cdot w \cdot t}}{t^2}$ $\frac{-((w-a) \cdot \ln \text{Sign}(w-a))}{2 \cdot \pi \cdot e^{i \cdot t \cdot a} + \delta(t)}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>	$\frac{\pi \cdot a }{ w \cdot a \cdot a^2}$ $\frac{\pi}{a \cdot w }$ $\frac{d1\theta(a+w)}{i \cdot t \cdot \theta(-(t-a))}$ $\frac{1}{2 \cdot \pi}$ $\frac{1}{2 \cdot \pi \cdot e^{i \cdot t \cdot a}}$ <p>Ftrex t-w w-t Fob+ Frul+ NRsin</p>
<p>ω->t: Fourier back transform (10s)</p>	$\frac{\theta(w+a)}{2 \cdot t \cdot \pi \cdot e^{i \cdot t \cdot a} + \delta(t)}$ $\frac{\delta(w+a)}{2 \cdot \pi \cdot e^{i \cdot t \cdot a}}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>	$\frac{1}{2 \cdot \pi}$ $\frac{t \cdot \text{Sign}(t)}{2}$ <p>Ftrex t-w w-t Fob+ Frul+ NRsin</p>
<p>ω->t: Fourier back transform (10s)</p>	$\frac{\text{Sign}(a+w)}{2 \cdot \pi \cdot e^{i \cdot t \cdot a}}$ $\frac{b}{a+w}$ $\frac{i \cdot b \cdot \text{Sign}(t)}{2 \cdot \pi \cdot e^{i \cdot t \cdot a}}$ <p>Ftrex t-w w-t Fob+ Frul+ NRsin</p>	$\frac{e^{-i \cdot a \cdot w}}{\delta(t-a)}$ $\frac{\text{Rec}(w)}{\text{Sinc}\left(\frac{t}{2 \cdot \pi}\right)}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>
<p>ω->t: Fourier back transform of rational functions (27s)</p> <p>Σ->Lin: linearise terms</p> <p>next example (15s)</p>	$\frac{w}{(w-3) \cdot (w+2)}$ $\frac{i \cdot \text{Sign}(t)}{5 \cdot e^{2 \cdot i \cdot t}} + \frac{3 \cdot i \cdot e^{3 \cdot i \cdot t} \cdot \text{Sign}(t)}{10}$ $\frac{i \cdot \text{Sign}(t)}{5} \cdot e^{-(2 \cdot i \cdot t)} + \frac{3 \cdot i \cdot \text{Sign}(t)}{10}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>	$\frac{2}{(w-5)^3}$ $\frac{i \cdot t^2 \cdot e^{5 \cdot i \cdot t} \cdot \text{Sign}(t)}{2}$ <p>Ftrex t-w w-t E+Lin NRsin Fsimp</p>

$\omega \rightarrow t$: Fourier back transform of rational functions (40s)	<pre>6: 5: 4: 3: 2: 1: 1: 3 (w-4)^2*(w+5) 1: i*Sign(t) + i*e^4*i*t*Sign(t) + t 54*e^5*i*t 54</pre> <p>Ftrex t+w w+t E+LinNRsinFsimp</p>	<pre>6: 5: 4: 3: 2: 1: 1: 1 (w-1+i)*w 1: Sign(t) + i*Sign(t) + e 4 4 (1+i)*t</pre> <p>Ftrex t+w w+t E+LinNRsinFsimp</p>
next example (30s)		
Fsimp: simplify terms with special functions (2s)	<pre>6: 5: 4: 3: 2: 1: 1: s(-(t-2)) s(t-2) s(2*(3-t)) s(3-t) 0(t-t) 1-0(t) 0(3-t) 0(t)</pre> <p>Ftrex t+w w+t E+LinNRsinFsimp</p>	<pre>6: 5: 4: 3: 2: 1: 1: i i*w-2 1 w+2*i</pre> <p>Ftrex t+w w+t E+LinNRsinFsimp</p>
iExpfrac: expand fraction with i (1s)		
Fab-> set Fourier parameters a=0, b=1 modern physics (1s)	<pre>6: 5: 4: 3: 2: 1: 1: D(a+t) i*w*a e 0 1</pre>	