

Problem 5.16:

16. In certain kinds of structural vibrations, a periodic force acting on the structure will cause the vibration amplitude to repeatedly increase and decrease with time. This phenomenon, called *beating*, also occurs in musical sounds. A particular structure's displacement is described by

$$y(t) = \frac{1}{f_1^2 - f_2^2} [\cos(f_2 t) - \cos(f_1 t)]$$

where y is the displacement in inches and t is the time in seconds. Plot y versus t over the range $0 \leq t \leq 20$ for $f_1 = 8$ rad/sec and $f_2 = 1$ rad/sec. Be sure to choose enough points to obtain an accurate plot.

```
function y = funprob5_16 (t)
f1 = 8;
f2 = 1;
y = 1/(f1^2 - f2^2)*(cos(f2*t) - cos(f1*t));
end
```

```
% Problem 5.16
clear
clc
disp('Problem 5.16: Scott Thomas')

fplot(@funprob5_16, [0,20])
xlabel('Time'), grid on, ylabel('y(t)')
title('Problem 5.16: Scott Thomas')
```

