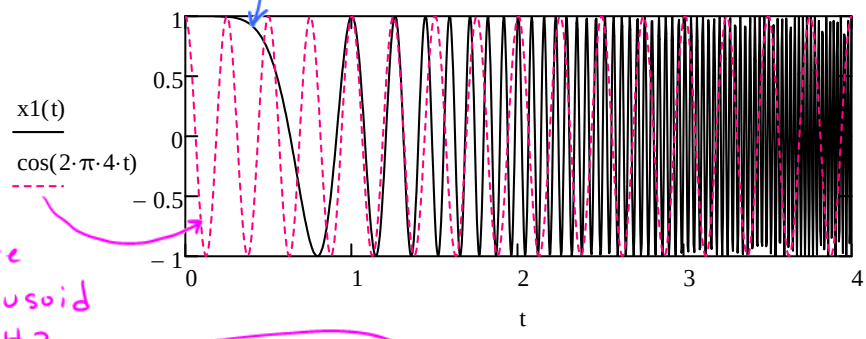
We want $f(t) = t^2$ at $t = 2$

$f(2) = 2^2 = 4$ Hz

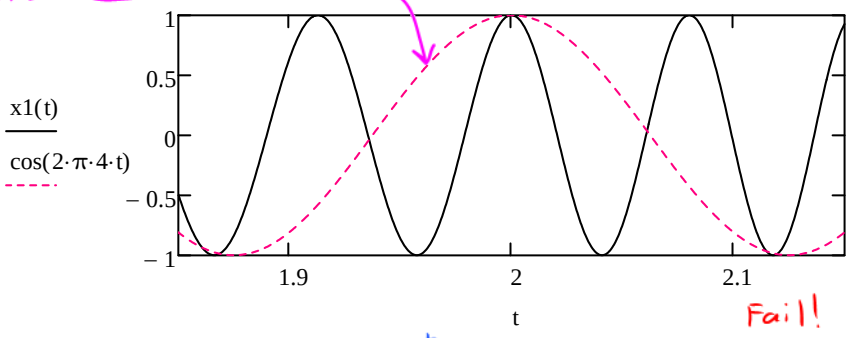
Instantaneous Frequency

1

$x1(t) := \cos\left(2\cdot\pi\cdot t^2\cdot t\right)$



pure sinusoid 4 Hz



Fail! Not the same freq.

2

$x2(t) := \cos\left(2\cdot\pi\cdot\frac{t^3}{3}\right)$

$\cos\left(2\pi\int_0^t \tau^2\,d\tau\right) = \cos\left(2\pi\,\frac{t^3}{3}\right)$