$$y = \cos\left(\omega t + \frac{\pi}{2}\right) + 4.\sin\left(\omega t - \frac{\pi}{3}\right) - 3.\cos(\omega t) + \sin\left(\omega t + 4\frac{\pi}{3}\right) = ?$$

for $\omega = 2$

P.S. $\sin(\omega t) = \cos\left(\omega t - \frac{\pi}{2}\right)$

$\cos(\omega t) = \sin\left(\omega t + \frac{\pi}{2}\right)$

$$\cos\left(\omega t + \frac{\pi}{2}\right) + 4.\cos\left(\omega t - \frac{\pi}{3} - \frac{\pi}{2}\right) - 3.\cos(\omega t) + \cos\left(\omega t + 4\frac{\pi}{3} - \frac{\pi}{2}\right)$$

$$\cos\left(\omega t + \frac{\pi}{2}\right) + 4\cos\left(\omega t - \frac{5\pi}{6}\right) - 3.\cos(\omega t) + \cos\left(\omega t + \frac{5\pi}{6}\right)$$

$$e^{\frac{\pi}{2}j} + 4\,e^{-\frac{5\pi}{6}j} - 3\,e^{j.0} + e^{j\frac{5\pi}{6}}$$

$$j + 4.\left(-\frac{1}{2}j - \frac{\sqrt{3}}{2}\right) - 3 + \left(\frac{1}{2}j - \frac{\sqrt{3}}{2}\right)$$

$$j + (-2j) + (-2\sqrt{3}) - 3 + \frac{1}{2}j - \frac{\sqrt{3}}{2}$$

$$z = -\frac{1}{2}j - 3 - \frac{5\sqrt{3}}{2}$$

→ Matlab

$abs(z) = 7{,}3472$

$angle(z) = -3{,}0735\pi$

$$y_2 = 7{,}3472\cos(\omega t + (-3{,}0735\pi))$$

for $N = 2$

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New to MATLAB? See resources for Getting Started.

```
>>
>> t=1:.1:10;
>> y=cos(2*t+pi/2)+4*sin(2*t-pi/3)-3*cos(2*t)+sin(2*t+4*pi/3);
>> plot(t,y)
>> y2=7.3472*cos(2*t-3.0735);
>> hold on
>> plot(t,y2,'o')
fx >>
```

Figure 1

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