No.

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2. $y[n] = -0,7y[n-2] + x[n] - x[n-2]$

a. orde 2

b. $Y(z) + 0,7z^{-2}Y(z) = X(z) - z^{-2}X(z)$

$$\frac{Y(z)}{X(x)} \cdot \frac{1 - z^2}{1 + 0,7z^{-2}}$$

$$H(z) = \frac{z^2 - 1}{z^2 + 0,7}$$

Zero : $z^2 - 1 = 0$

$(z+1)(z-1) = 0$

$z_1 = -1$

$z_2 = 1$

Sistem stabil karena zero $|z| = 1$

c. $$H(e^{j\omega}) = \frac{1 - e^{-2j\omega}}{1 + 0,7e^{-2j\omega}} \times \frac{1 - 0,7e^{-2j\omega}}{1 - 0,7e^{-2j\omega}}$$

$$= \frac{1 - 1,7e^{-j\omega} + 0,7e^{-4j\omega}}{1 - 0,49}$$

$$= \frac{1}{0,51}\left(1 - 1,7e^{-j2\omega} + 0,7e^{-j4\omega}\right)$$

$$= \frac{1}{0,51}\left(1 - 1,7(\cos 2\omega - j\sin 2\omega) + 0,7(\cos 4\omega - j\sin 4\omega)\right)$$

$$= \frac{1}{0,51} - \frac{10}{3}\cos 2\omega + \frac{70}{51}\cos 4\omega + j\left(\frac{10}{3}\sin 2\omega - \frac{70}{51}\sin 4\omega\right)$$

d. $$|H(e^{j\omega})| = \sqrt{\left(\frac{1}{0,51} - \frac{10}{3}\cos 2\omega + \frac{70}{51}\cos 4\omega\right)^2 + \left(\frac{10}{3}\sin 2\omega - \frac{70}{51}\sin 4\omega\right)}$$

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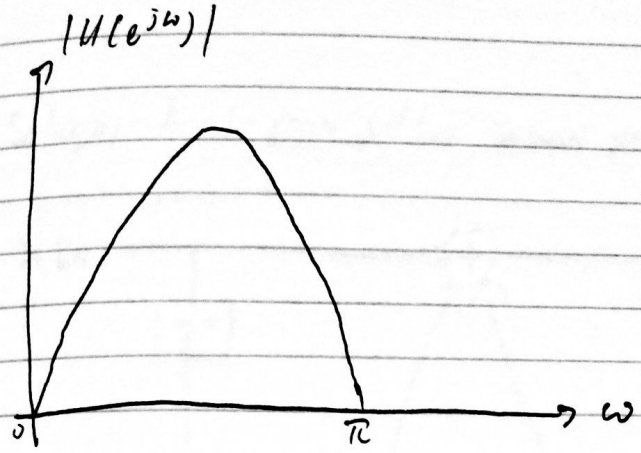
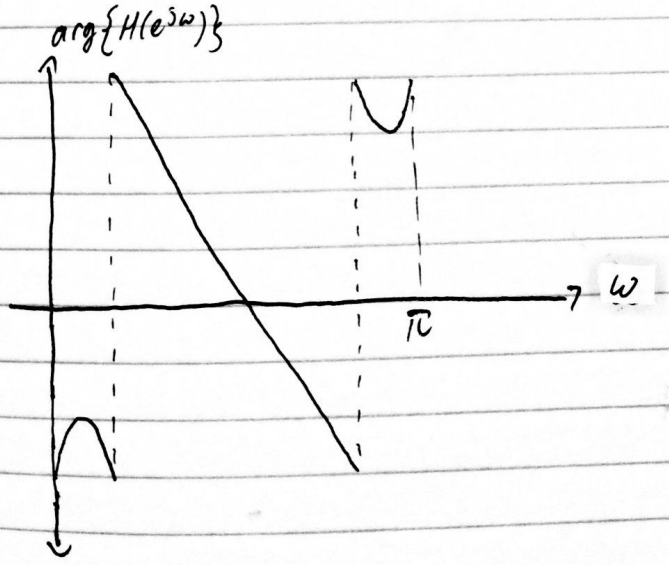
e.



f. $\arg\{H(e^{j\omega})\} = \tan^{-1}\left(\frac{Im}{Re}\right)$

$$= \tan^{-1}\left(\frac{\frac{\omega}{3}\sin 2\omega - \frac{70}{51}\sin 4\omega}{\frac{1}{0,51} - \frac{\omega}{3}\cos 2\omega + \frac{70}{51}\cos 4\omega}\right)$$

g.



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h. $x[n] = 2\cos\left(\frac{\pi}{2}n\right) \rightarrow \omega = \frac{\pi}{2}$

$$|H(e^{j0,5\pi})| = \sqrt{\left(\frac{1}{0,5} - \frac{10}{3}\cos 2.\frac{\pi}{2} + \frac{20}{51}\cos 4.\frac{\pi}{2}\right)^2 + \left(\frac{10}{3}\sin 2.\frac{\pi}{2} - \frac{20}{51}\sin 4.\frac{\pi}{2}\right)^2}$$

$$= 6,67$$

$$\arg\{H(e^{j0,5})\} = 0$$

$$Y[n] = A\,|H(e^{j\omega})|\cos(\omega_0 n + \arg\{H(e^{j\omega})\}$$

$$= 2 . 6,67 \cos\left(\frac{\pi}{2}n + 0\right)$$

$$= 13,34 \cos\left(\frac{\pi}{2}n\right)$$

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1. Sebagai band-pass filter sesuai pada gambar graf th nomor a.

5.