1. A unity negative feedback control system has the plant

$G(s)=\dfrac{K}{(s+8)(s+14)+(s+20)}$ *. Set dominant poles in the place with* $\xi=0.7$ *and* $\omega_n=17$ *by lead controller. Cancel one of the poles too. 47-7raoof*

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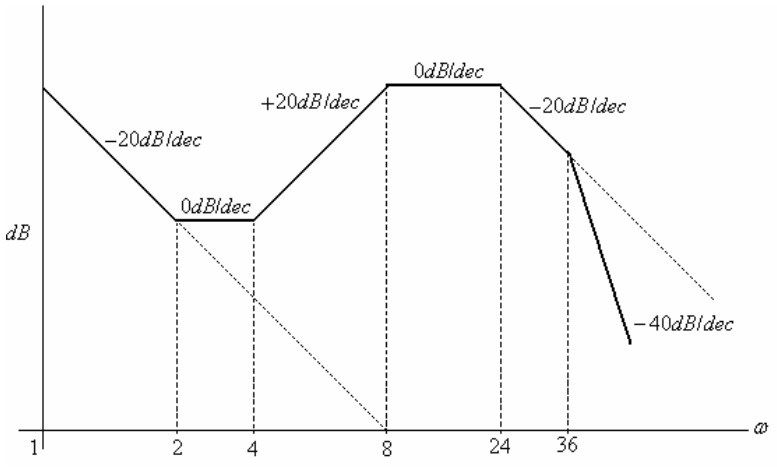
2. The magnitude plot of a transfer function:

$$G(s)=\frac{k(1+0.5s)(1+as)}{s(1+s/8)(1+bs)(1+s/36)}$$

Is shown in Figure. Determine k, a, and b from the plot.



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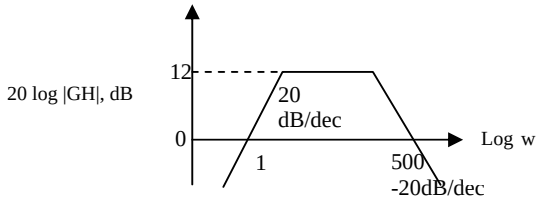
3. The magnitude plots of minimum phase systems are shown, find

a. Phase plot of each system

b. transfer function of each system



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4. Plot Bode diagram of open loop system with $G(s)=\dfrac{2(s+2)}{s^2-1}$ *and find its gain margin and phase margin. Is closed loop system stable?*

5. Plot Nyquist diagram of systems and find gain domain (k) for stability of system.

a. $\frac{k(s+1)}{(s-1)}$

b. $\frac{k(s+1)}{s^2-4}$

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6. Nyquist diagrams of open loop system are shown bellow. G(s) has no right zero and right pole. Find the stability of each system.

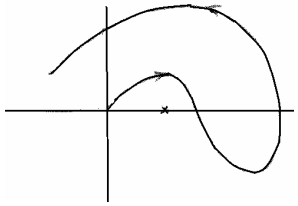

Fig b

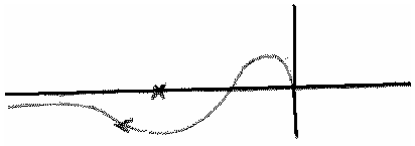

Fig a

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7. Is the system shown in Fig. is stable? If not how many right zeros dose it have if GH(s) has no right zeros and poles? Is system stable If that black point is -1?