

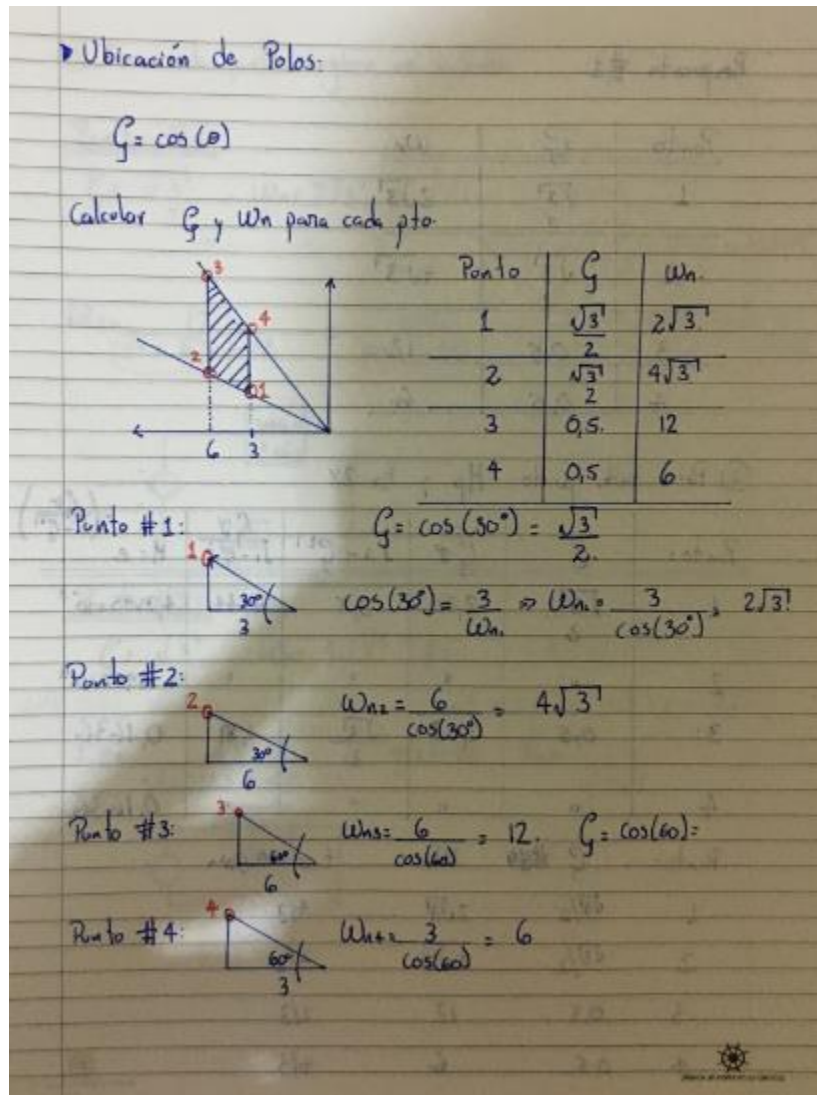
Tarea Número 4.

Control Automático EM 720

Fecha de entrega: martes 12 de junio 2018

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Respuesta #1:

Punto	$G$	$\omega_n$
1	$\frac{\sqrt{3}}{2}$	$2\sqrt{3}$
2	$\frac{\sqrt{3}}{2}$	$4\sqrt{3}$
3	0,5	12
4	0,5	6

② Para cada punto:  $M_p$  y  $t_{2\%}$

Punto	$G$	$G_r$	$\sqrt{1-G^2}$	$\frac{G_r}{\sqrt{1-G^2}}$	$M = e^{-\left(\frac{G_r}{\sqrt{1-G^2}}\right)}$
1	$\frac{\sqrt{3}}{2}$	2,72	0,5	5,44	$4,3395 \times 10^{-3}$
2	"	"	"	"	$4,3395 \times 10^{-3}$
3	0,5	1,57	$\frac{\sqrt{3}}{2}$	1,81	0,1636
4	"	"	"	"	0,1636

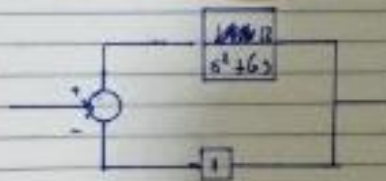
Punto	$G$	$\omega_n$	$t_{2\%} = 4/G\omega_n$
1	$\sqrt{3}/2$	$2\sqrt{3}$	$4/3$
2	$\sqrt{3}/2$	$4\sqrt{3}$	$2/3$
3	0,5	12	$2/3$
4	0,5	6	$4/3$

③ Para cada punto sugiero un sistema:

Punto #1:

$$\zeta = \frac{\sqrt{3}}{2}, \omega_n = 2\sqrt{3} \Rightarrow f.t. = \frac{(2\sqrt{3})^2}{s^2 + 2\left(\frac{\sqrt{3}}{2}\right)2\sqrt{3}s + (2\sqrt{3})^2}$$

$$f.t. = \frac{12}{s^2 + 6s + 12} \Rightarrow \frac{q(s)}{p(s) + q(s)} \Rightarrow q(s) = 12, p(s) = \frac{1}{s^2 + 6s}$$



Punto #2:

$$\zeta = \frac{\sqrt{3}}{2}, \omega_n = 4\sqrt{3} \Rightarrow f.t. = \frac{(4\sqrt{3})^2}{s^2 + 2\left(\frac{\sqrt{3}}{2}\right)(4\sqrt{3})s + (4\sqrt{3})^2}$$

$$f.t. = \frac{48}{s^2 + 12s + 48} \Rightarrow q(s) = 48, p(s) = \frac{1}{s^2 + 12s}$$

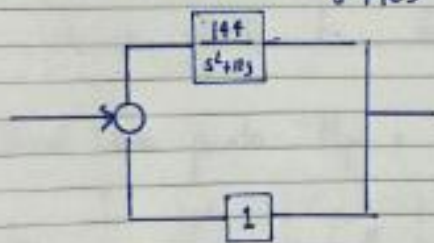


Ponto #3:

$$\zeta = 0,5 \quad \omega_n = 12$$

$$f.t. = \frac{144}{s^2 + (2)(0,5)(12)s + 144} = \frac{144}{s^2 + 12s + 144}$$

$$q(s) = 144, \quad p(s) = \frac{1}{s^2 + 12s}$$



Ponto #4:  $\zeta = 0,5 \quad \omega_n = 6$

$$f.t. = \frac{36}{s^2 + 2(0,5)6s + 36} = \frac{36}{s^2 + 6s + 36} \Rightarrow q(s) = 36 \quad p(s) = s^2 + 6s$$

