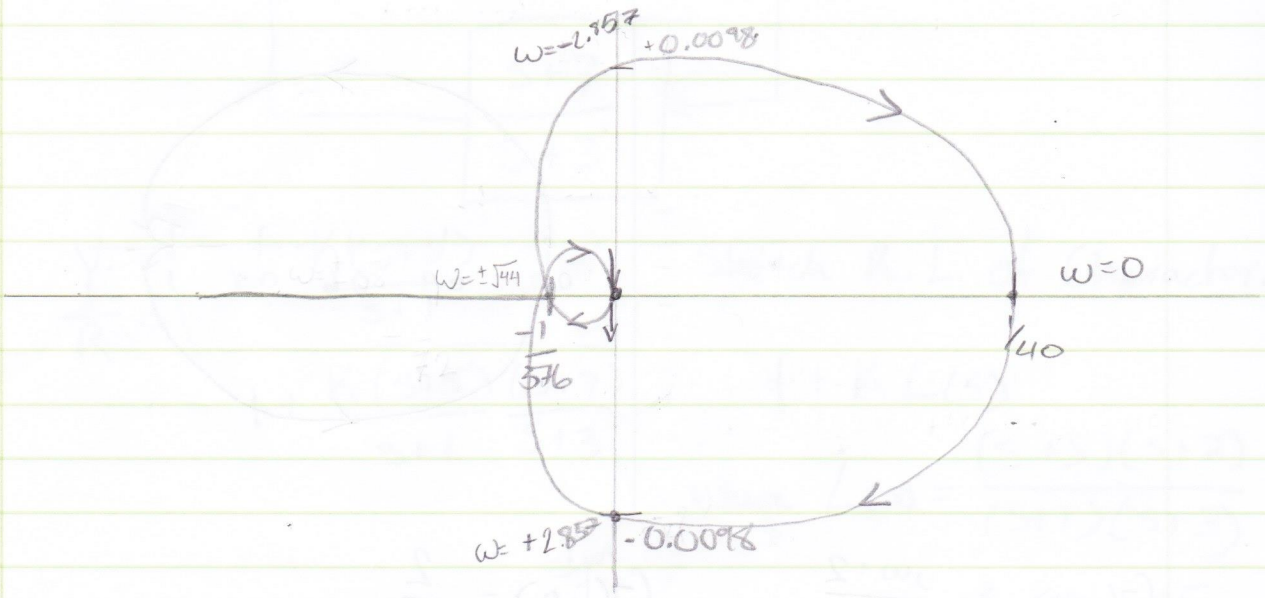
6.19b) $K\uparrow G(s) = \dfrac{K}{(s+10)(s+2)^2}$



$$G(j\omega) = \frac{1}{(j\omega+10)(j\omega+2)^2} = \frac{1}{j(-\omega^3+44\omega)+(-14\omega^2+40)}$$

$$G(j0) = \frac{1}{10\cdot 2^2} = \frac{1}{40} \quad \checkmark$$

Real intercepts: $-\omega^3+44\omega = 0 \qquad \omega = 0, \pm\sqrt{44} = \pm 6.63$

$$G(j\sqrt{44}) = \frac{1}{-14\cdot 44+40} = \frac{-1}{576} = -0.00174$$

imaginary intercepts: $-14\omega^2+40 = 0 \qquad \omega = \pm 2.857$

$$\frac{1}{j(-(\pm 2.857)^3+44(\pm 2.857))} = j\,\frac{-1}{\pm 102.4} = \mp 0.0098j$$

$$G(\infty e^{j\theta}) \quad \lim_{r\to\infty} \frac{1}{(re^{j\theta}+10)(re^{j\theta}+2)^2} = \lim_{r\to\infty} \frac{1}{r\,e^{3j\theta}} = 0\cdot e^{-3j\theta}$$

$\theta = \frac{\pi}{2}, \quad G(\infty e^{j\theta}) = 0\cdot e^{j\,-\frac{3\pi}{2}} \;\Big|\; \theta = \frac{-\pi}{2}, \quad G(\infty e^{j\theta}) = 0\cdot e^{j\frac{5\pi}{2}}$