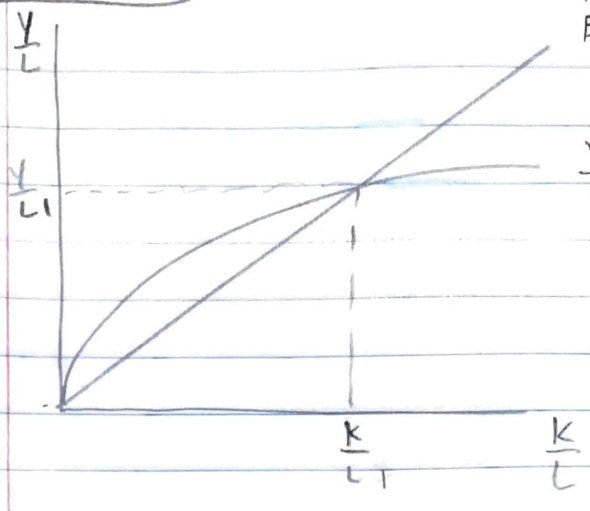
$s = 36\%$ $g = 2\%$ $\alpha = 1/3$
$n = 1/2\%$ $\delta = 1\frac{1}{2}\%$ $E_0 = \$20{,}000/yr$

Q5A



In equilibrium, if E constant

$\text{slope} = \frac{Y}{K} = \frac{\delta + n + g}{s}$

$\frac{Y}{L} = \left(\frac{K}{L}\right)^{\alpha} E^{1-\alpha}$

$E = E_0$

$\frac{K}{Y} = \frac{s}{\delta + n + g}$

$\frac{K}{Y} = \frac{0.36}{0.015 + 0.005 + 0.02}$

capital-output ratio: $\frac{K}{Y} = 9$

$\frac{Y}{L} = \left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}} \cdot E$

$\frac{Y}{L} = (9)^{\frac{1}{2}} \cdot \$20{,}000/yr$

$\frac{Y}{L} = \$60{,}000 \text{ per worker per yr}$

$\frac{Y}{L} = \left(\frac{K}{L}\right)^{\alpha} E^{1-\alpha}$

$\$60{,}000 \frac{\text{/worker}}{\text{year}} = \left(\frac{K}{L}\right)^{\frac{1}{3}} (\$20{,}000)^{\frac{2}{3}} yr$

$3\left(\frac{60{,}000}{(20{,}000)^{\frac{2}{3}}}\right) = \frac{K}{L}$

$\frac{K}{L} = \$540{,}000 \text{ per worker per yr}$

Q5B

$g\left(\frac{K}{L}\right) = g\left(\frac{Y}{L}\right)$ in BGE, both $= g(E)$

$g(E) = 0.02$

$\frac{K}{L}_{t=10} = 540000 \times (1.02)^{10}$

$\frac{K}{L}_{t=10} = \$658256.99$ per worker per year

$\frac{Y}{L}_{t=10} = 60000 \times (1.02)^{10}$

$\frac{Y}{L}_{t=10} = \$73139.67$ per worker per year