Two-sector model

1. For each of the following:

   (a) draw the Harrod-Johnson diagram, and
   (b) calculate the incomplete specialization output price ratios, $\bar{p}$ and $p$, and indicate what happens to these as $k$ (the overall capital intensity) is varied.

   (i)
   \[
   \begin{align*}
   Y_1 &= \frac{K_1^{1/2}L_1^{1/2}}{2} \\
   Y_2 &= \frac{K_2^{3/4}L_2^{1/4}}{2} \\
   K &= 16, \; L = 16
   \end{align*}
   \]

   (ii)
   \[
   \begin{align*}
   Y_1 &= 6K_1^{1/2}L_1^{1/2} \\
   Y_2 &= 12K_2^{1/2}L_2^{1/2} \\
   K &= 50, \; L = 10
   \end{align*}
   \]

   (iii)
   \[
   \begin{align*}
   Y_1 &= 5K_1^{4/5}L_1^{1/5} \\
   Y_2 &= 10K_2^{1/2}L_2^{1/2} \\
   K &= 80, \; L = 10
   \end{align*}
   \]

   (iv)
   \[
   \begin{align*}
   Y_1 &= 4K_1^{1/4}L_1^{3/4} \\
   Y_2 &= 4K_2^{1/4}L_2^{3/4} \\
   K &= 25, \; L = 25
   \end{align*}
   \]

2. Describe the role of capital intensities in the 2-sector model. When is $p < \bar{p}$? When is $p > \bar{p}$? When is $p = \bar{p}$?

3. If two countries have the same output price ratio, do they have the same factor price ratio?