(b) [6 points] Assume the compiled programs run on two different processors. If the execution times on the two processors are the same, how much faster is the clock of the processor running compiler A's code versus the clock of the processor running compiler B's code?

$CPU = \frac{IC \times CPI}{\text{clock rate}}$ both A and B have the same so that means that it's execution time is the same.

$A\text{ clock rate} = \frac{IC_A \times CPI_A}{IC_B \times CPI_B} \times \text{clock rate}_B = \frac{10^9 \times 11}{1.2 \times 10^9 \times 1.25} \times CR_B$

A clock rate = 0.73 clock rate B → 73%

P_1 is about 27% slower than P_2

(c) [6 points] A new compiler is developed that uses only 6.0E8 instructions and has an average CPI of 1.1. What is the speedup of using the new compiler versus using compiler A or B on the original processor?

or $CPU_C = IC \times CPI \times \text{Cycle time} = 6 \times 10^8 \times 1.1 \times 10^{-9}\text{s} = 0.66\text{s}$

CPU time A / CPU time C →

$\frac{C}{A} = \frac{1.1\text{s}}{0.66\text{s}} = 1.67$

$\frac{C}{B} = \frac{1.5\text{s}}{0.66\text{s}} = 2.27$

C is about 1.67 times faster than A, and about 2.27 times faster than B