5. The results of the SPEC CPU2006 bzip2 benchmark running on an AMD Barcelona has an instruction count of 2 389E12, an execution time of 750s, and a reference time of 9650s.

(a) [6 points] Find the CPI if the clock cycle time is 0.333ns.

execution time = clock cycles X cycle time

Based on equation and given variables, isolate the variable I am solving for → "clock cycles"

exec-time = 750s
cycle time = 0.333 ns
convert ns = 0.333×10^{-9} s

clock cycles = $\frac{750}{0.333 \times 10^{-9}} = 2.25 \times 10^{12}$

recall: $ns = 10^{-9}$ s

clock cycles = # of instructions X CPI

CPI = $\frac{CC}{\#\text{ of}} = \frac{2.25 \times 10^{12}}{2.389 \times 10^{12}} = \boxed{0.94}$ ← CPI

(b) [6 points] Find the SPECratio. = SPECration = SPECr ←

SPEC ratio = $\frac{\text{Refence time}}{\text{exec time}} = \frac{9650}{750}$ ← given / ← given $= 12.87$