Bernardo Hernandez

1.

CPU time = IC x CPI x CT

CPU time = $\frac{IC \times CPI}{\text{Clock rate}}$ → $CPI = \frac{(\text{CPU time})(\text{Clock rate})}{IC}$

$M1 = \frac{(20 \text{ seconds})(900 \text{ mhz})}{500,000,000}$

$= \frac{14,000,000,000}{500,000,000} = 36$

$M2 = \frac{(1.5)(800 \text{ mhz})}{400,000,000} \Rightarrow \frac{12,000,000,000}{400,000,000} = 30$

$M_1 = 36$
$M_2 = 30$

2

$$\frac{8 \times (900 \times 10^6)}{36} = 200,000,000 = M1$$

$$\frac{10 \times (800 \times 10^6)}{30} = 266,666,666.66 = M2$$

3. M1 Clock rate = 800 mhz CPI_A = 7
B = 2
C = 3
D = 1

CCT = $\frac{1}{800 \times 10^6} = 1.25 ns$

Mips = $\frac{1}{(1.25 \times 10^{-9}) \times 10^6} =$ 800 mips

M2 clock rate = 900 mhz

CCT$_{new}$ = $\frac{1}{900 \times 10^6} = 1.22 ns$

mips = $\frac{1}{(1.22 \times 10^{-9}) \times 10^6} =$ 950 mps

4 Clock rate = $\frac{1}{CCT}$

$CCT = \frac{1}{\text{rate}}$

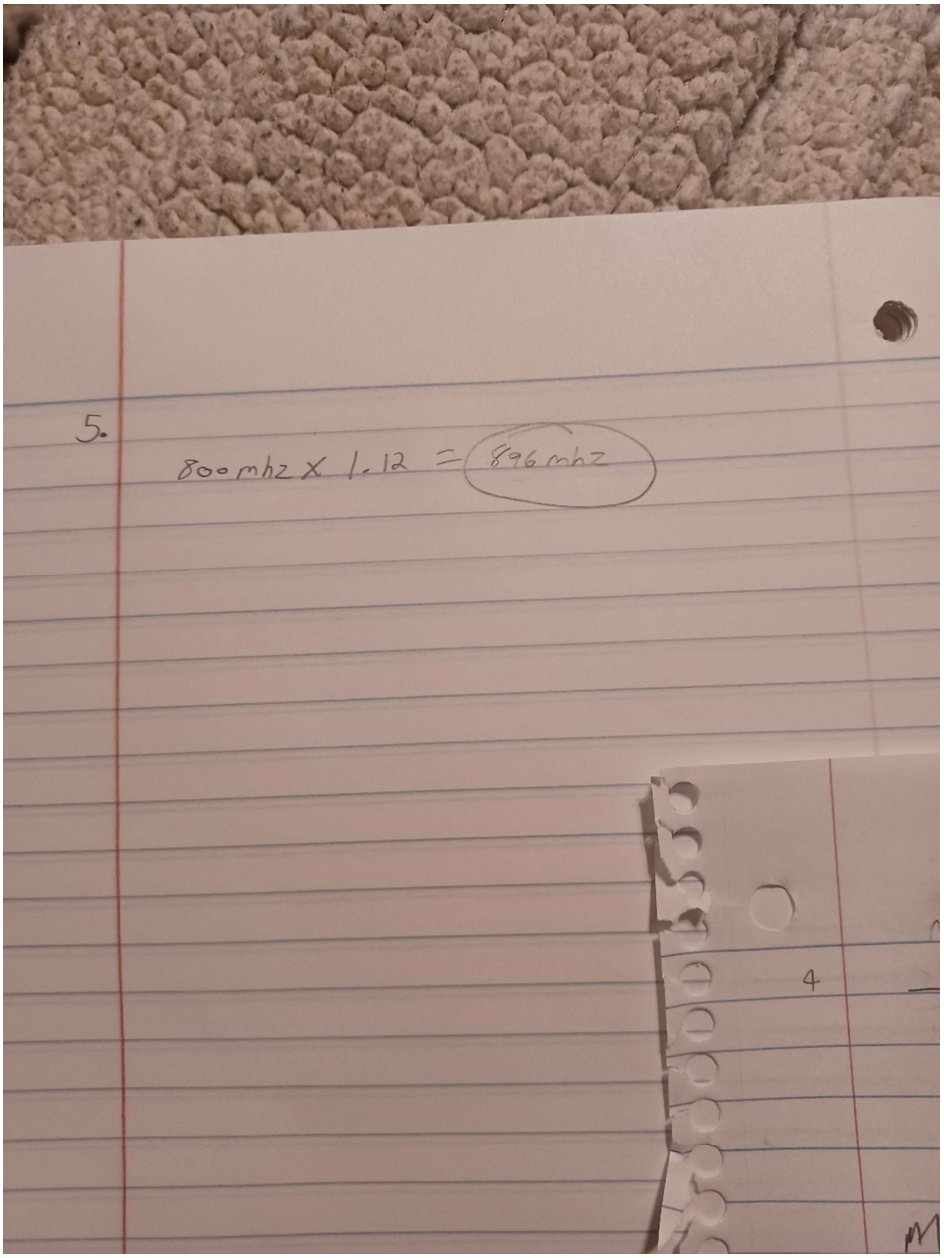
M1 $\frac{1}{800 \times 10^6} = 1.25\,ns$

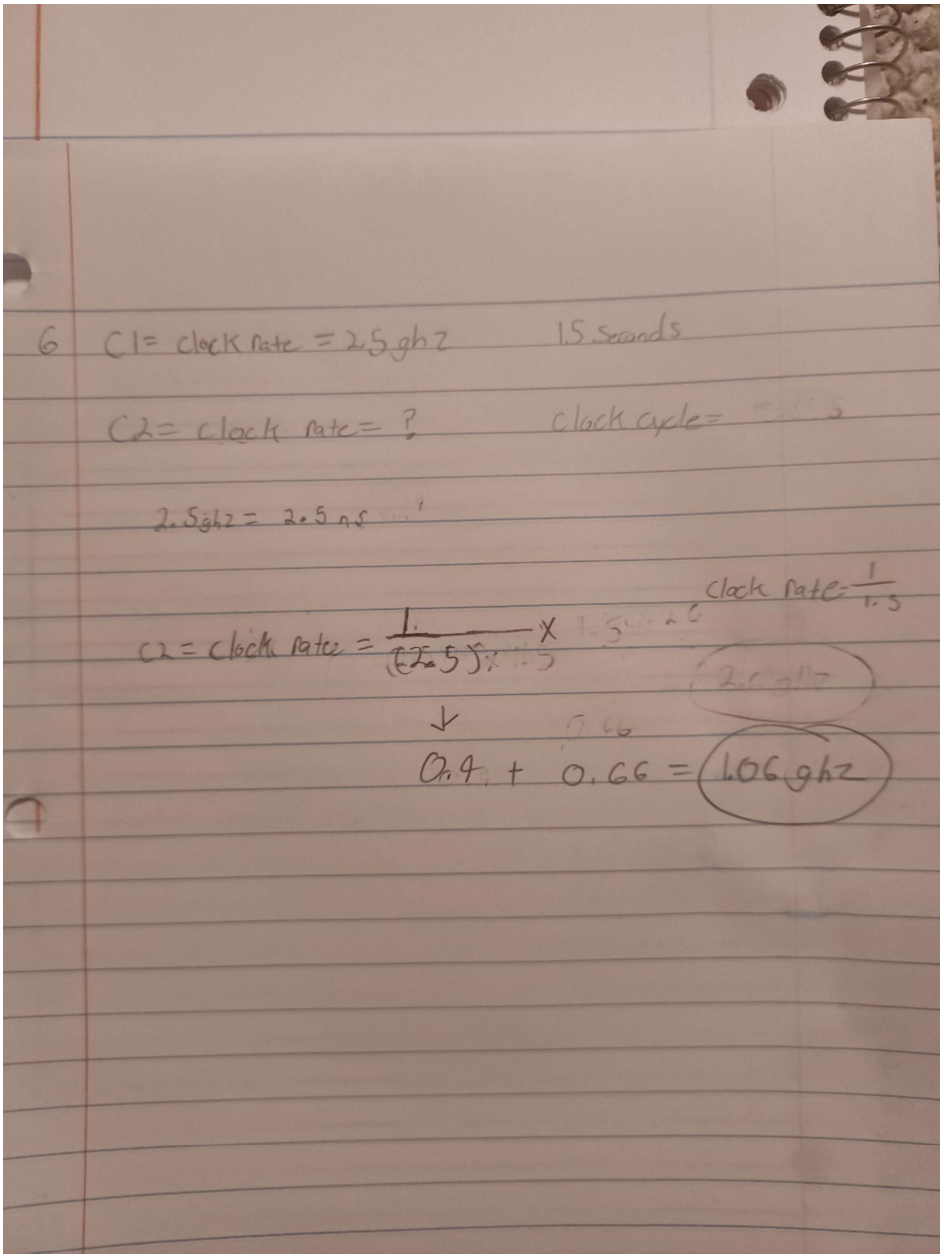
M2 $\frac{1}{900 \times 10^6} = 1.11\,ns$

$\frac{\text{exe time of slower}}{\text{exe time of faster}}$

$\frac{M1}{M2} = \frac{1.25}{1.11} = 1.12$

M2 is faster by 1.12


5.
800mhz X 1.12 = 896mhz
4



6 C1 = clock rate = 2.5 ghz 1.5 seconds

C2 = clock rate = ? clock cycle =

2.5ghz = 2.5 ns

C2 = clock rate = $\frac{1}{2.5} \times$ clock rate $= \frac{1}{1.5}$

↓

0.4 + 0.66 = 1.06 ghz