Pipeline Questions:

Assume the five-stage pipeline as we've discussed in class with the following times:

| Fetch | Decode | Execute | Memory | Write Back |
|-------|--------|---------|--------|------------|
| 305 ps | 275 ps | 280 ps | 305 ps | 250 ps |

a) Given the times for the datapath stages listed above, what would the clock period be for the entire datapath?

b) What is the clock rate?

c) In a pipelined datapath, assuming no hazards or stalls, how many seconds will it take to execute 1 instruction?

d) Assuming that N instructions are executed, and all N instructions are add instructions, what is the speedup of a pipelined implementation when compared to a multi-cycle implementation?

Your answer should be an expression that is a function of N.