Brian Reber
CprE 381 Lab 1

1.

b)

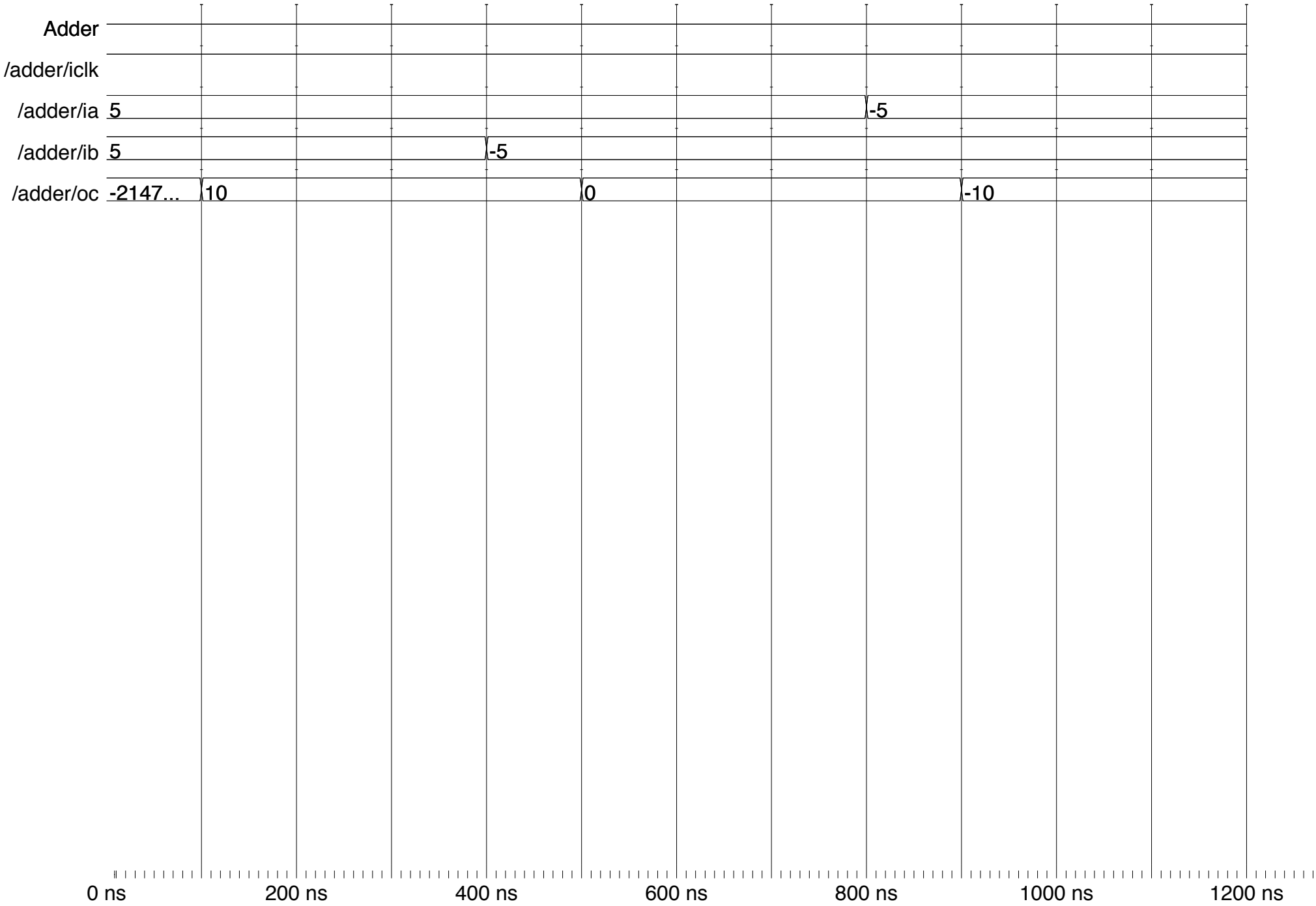
1. cA - Quadratic.vhd - 49 - A constant input to g_Mult1
2. iX - Quadratic.vhd - 25 - An input to both g_Mult1 and g_Mult2
3. cB - Quadratic.vhd - 50 - A constant input to g_Mult2
4. cC - Quadratic.vhd - 51 - A constant input to g_Add1
5. iCLK - Quadratic.vhd - 24 - The clock value for the entire Quadratic system
6. iA - Multiplier.vhd - 29 - An input for g_Mult1
7. iB - Multiplier.vhd - 30 - An input for g_Mult2
8. X - Multiplier.vhd - 35 - The actual processing of the multiplier
9. Black Box - Multiplier.vhd - 40 - The check for the clock input
10. oC - Multiplier.vhd - 31 - The output for the multiplier
11. g_Mult1 - Quadratic.vhd - 66 - A multiplier entity within the Quadratic entity
12. iA - Multiplier.vhd - 29 - An input to g_Mult2
13. iB - Multiplier.vhd - 30 - An input to g_Mult2
14. oC - Multiplier.vhd - 31 - The output of g_Mult2
15. g_Mult2 - Quadratic.vhd - 72 - A multiplier entity within the Quadratic entity
16. iA - Adder.vhd - 29 - An input to g_Add1
17. iB - Adder.vhd - 30 - An input to g_Add2
18. + - Adder.vhd - 35 - The actual processing of the adder
19. Black Box - Adder.vhd - 40 - The check for the clock input
20. oC - Adder.vhd - 31 - The output of g_Add1
21. g_Add1 - Quadratic.vhd - 87 - An adder entity in the Quadratic entity
22. iA - Multiplier.vhd - 29 - An input to g_Mult3
23. iB - Multiplier.vhd - 30 - An input to g_Mult3
24. oC - Multiplier.vhd - 31 - The output of g_Mult3
25. g_Mult3 - Quadratic.vhd - 81 - A multiplier entity within the Quadratic entity
26. iA - Adder.vhd - 29 - An input to g_Add2
27. iB - Adder.vhd - 30 - An input to g_Add2
28. oC - Adder.vhd - 31 - The output of g_Add2
29. g_Add2 - Quadratic.vhd - 96 - An adder entity within the Quadratic entity
30. oY - Quadratic.vhd - 26 - The output of the Quadratic entity
31. Quadratic - Quadratic.vhd - 22 - The combination of the 3 multipliers and 2 adders

h) Attached are the screenshots (page with **Adder** in bold at the top) of the waveform for the simulations. For the add simulation (adder_sim.do), I set the simulation to have a period of 100ns, and it appears that the waveform matches the understanding I have of the design. It starts out with iA and iB both equal to 5. 100ns later, the output is 10. After the value of iB is changed to -5, the output is 0 100 ns later. So whenever the value of one of the inputs changed, the output waits for one period, and then changes to the value of the addition.

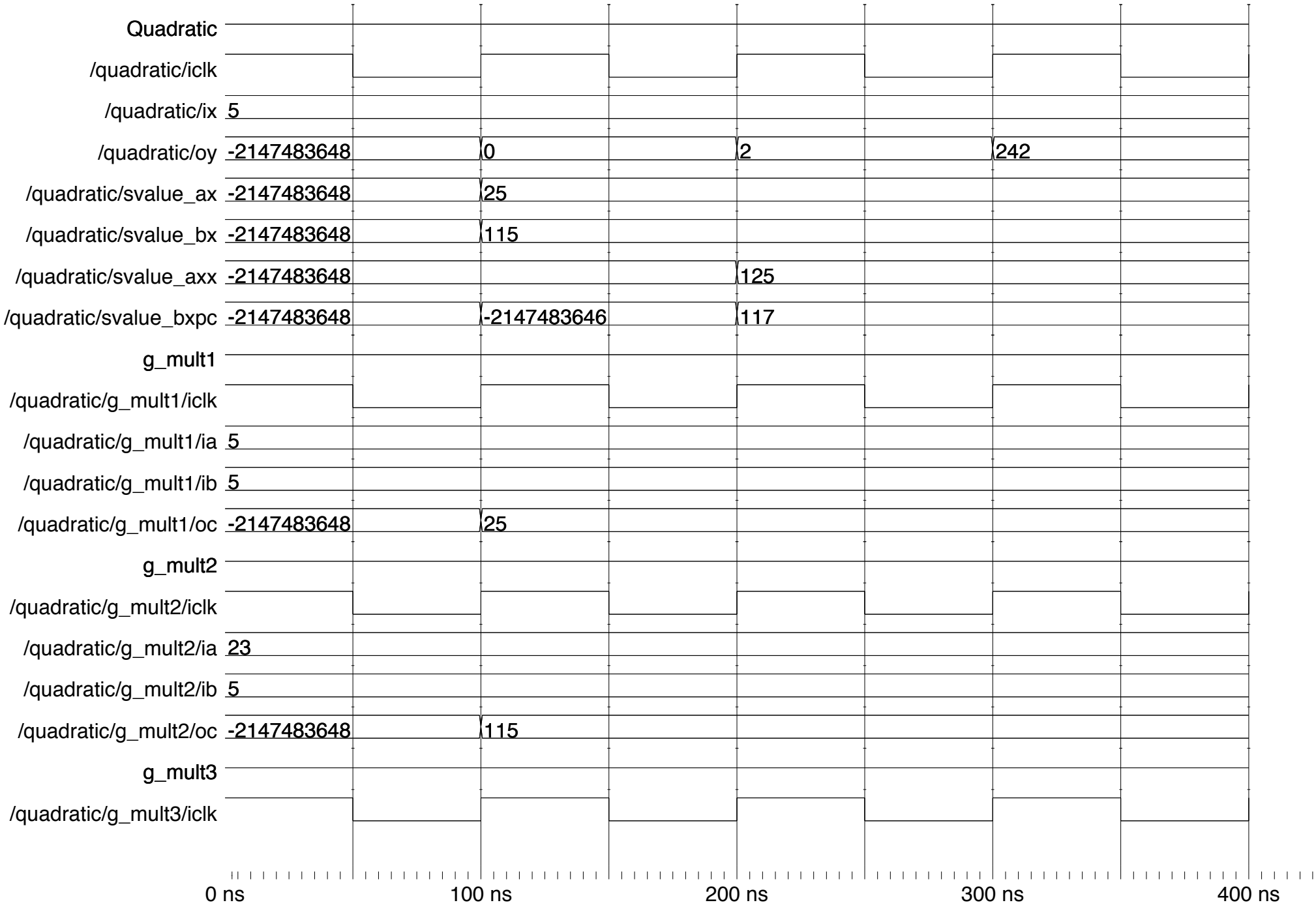
i) See the page with **Adder** in bold in the top left hand corner.

2. See the code in the Quadratic.vhd file within the src directory of the zip, and the page in this PDF containing **Quadratic** in bold in the top left hand corner of the page for the waveform.

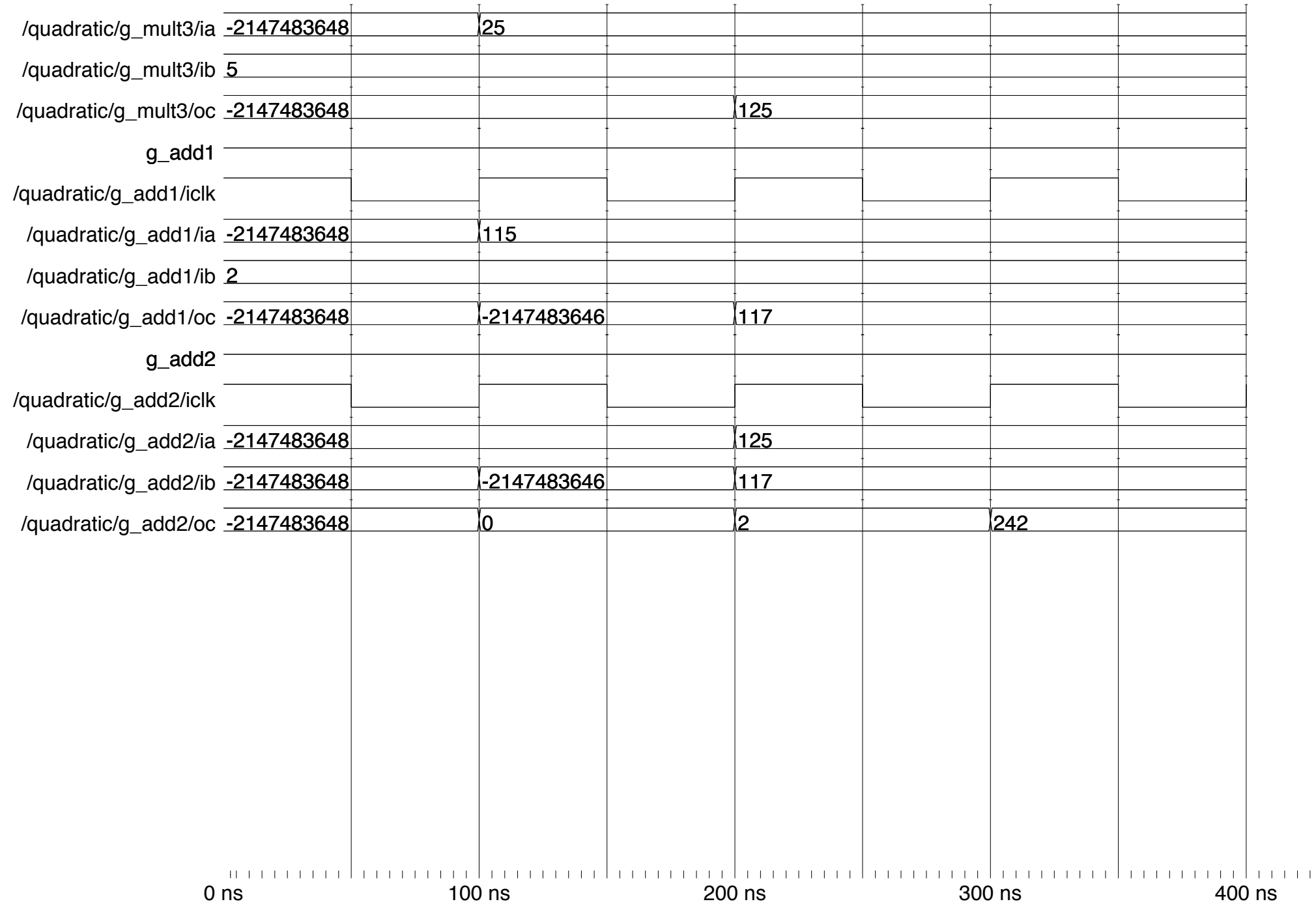
3. See the code for the Einstein entity in the Einstein.vhd file within the src directory, and the page within this PDF containing **Einstein** in bold in the upper left hand corner for the waveform.



Entity:adder Architecture:behavior Date: Wed Aug 24 03:22:41 PM CDT 2011 Row: 1 Page: 1



Entity:quadratic Architecture:structure Date: Wed Aug 24 02:50:47 PM CDT 2011 Row: 1 Page: 1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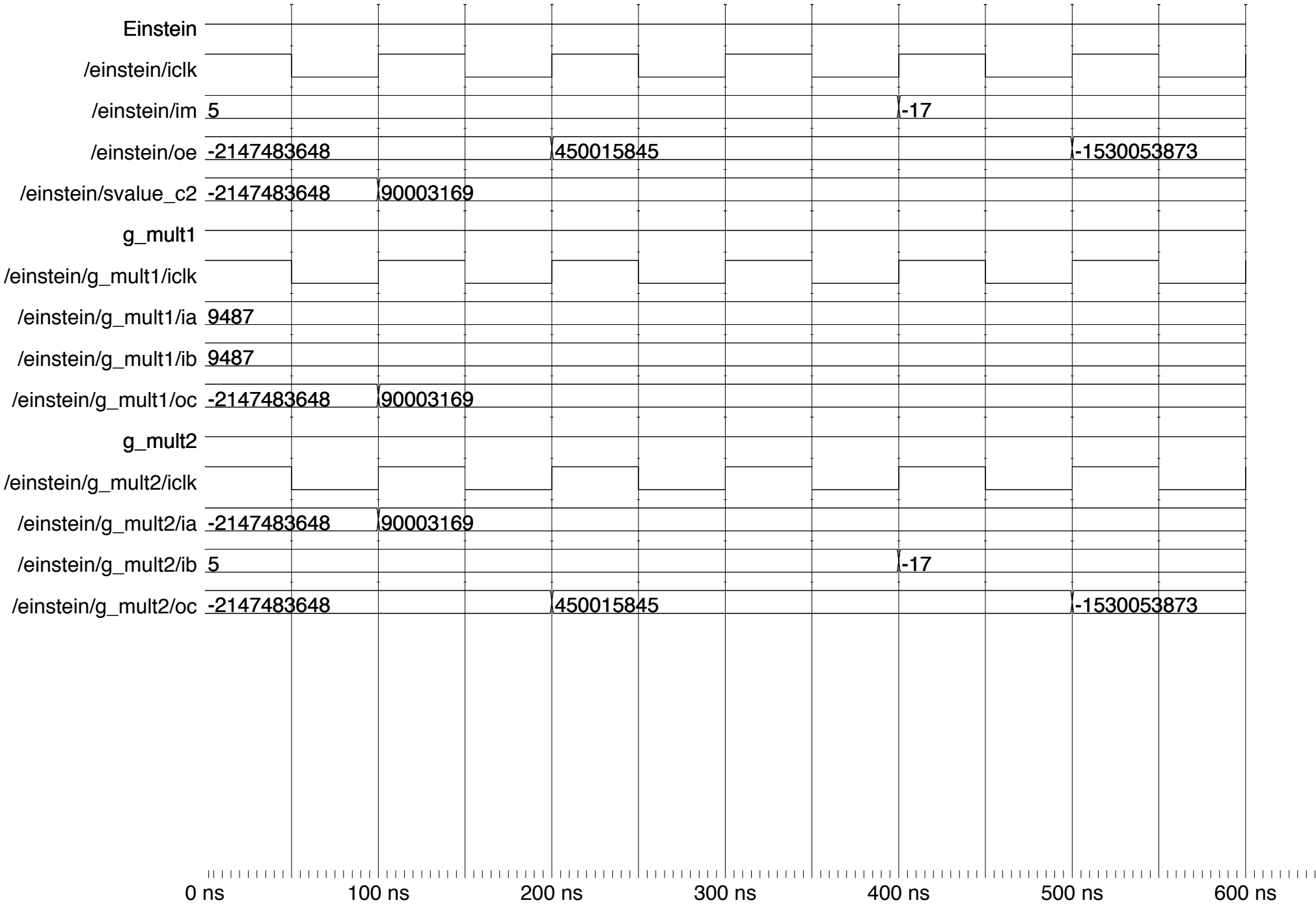
2
242
0 ns
100 ns
200 ns
300 ns
400 ns



Entity:einstein Architecture:structure Date: Wed Aug 24 03:23:04 PM CDT 2011 Row: 1 Page: 1