



m:
 $m = [(x \gg 1) + (x \gg 3)] - \{[(x \gg 6) + (x \gg 9)] + (x \gg 12)\}$

bits:
 $x_{in}: 9 \quad x_{calc}: 21 \quad x_{out}: 21 \quad start: 1 \quad i: 1 \quad 1 \text{ sum}$
 $y_{in}: 9 \quad y_{calc}: 21 \quad y_{out}: 21 \quad done: 1$
 $z_{in}: 20 \quad z_{calc}: 21 \quad x_{out}: 21 \quad mode: 1$

muxes:

- $x_{in}: q45_to_q516(x) \vee 0.6072529351 \rightarrow 1 \text{ mux_2x1}$
- $y_{in}: q45_to_q516(y) \vee 0 \rightarrow 1 \text{ mux_2x1}$
- $z_{in}: 0 \vee q416_to_q516(z) \rightarrow 1 \text{ mux_2x1}$
- $x_{calc}: (x_{in}) \vee (x_{calc} \pm (y_{calc} \gg i)) \vee (m) \rightarrow 1 \text{ mux_3x1}$
- $y_{calc}: (y_{in}) \vee (y_{calc} \pm (x_{calc} \gg i)) \rightarrow 1 \text{ mux_2x1}$
- $z_{calc}: (z_{in}) \vee \text{arctans}(i) \rightarrow 1 \text{ mux_2x1}$
- $\text{zero_comp arg: } (y_{calc}) \vee (z_{calc}) \rightarrow 1 \text{ mux_2x1}$
- 1st sum_or_sub args:** $[x_{calc}, (y_{calc} \gg i)] \vee [(x_{calc} \gg 1), (x_{calc} \gg 3)] \rightarrow 2 \text{ mux_2x1}$
- 2nd sum_or_sub args:** $[y_{calc}, (x_{calc} \gg i)] \vee \{[(x \gg 1) + (x \gg 3)], [(x \gg 6) + (x \gg 9) + (x \gg 12)]\} \rightarrow 2 \text{ mux_2x1}$
- 3rd sum_or_sub args:** $[z_{calc}, \text{arctans}(i)] \vee [(x_{calc} \gg 6), (x_{calc} \gg 9)] \rightarrow 2 \text{ mux_2x1}$