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EX.0.3.6, Sauer

Do the following sums by hand in IEEE double precision computer arithmetic, using the Rounding to Nearest Rule.

a.
$$(1 + (2^{-51} + 2^{-52} + 2^{-54})) - 1$$

b.
$$(1 + (2^{-51} + 2^{-52} + 2^{-60})) - 1$$

Q.
$$(|+(z^{-51}+z^{-52}+z^{-54})) = +1.\boxed{00....011} 01 \times z^{0}$$

Using the Rounding to Nearest Rule,
$$f(|+(z^{-51}+z^{-52}+z^{-54})) = +1.\boxed{00...011} \times z^{0}$$

Therefore, $f((|+(z^{-51}+z^{-52}+z^{-54}))-1) = .\boxed{00...011} \times z^{0}$

$$= 2^{-51}+2^{-52}$$

b.
$$(1+(z^{-51}+z^{-52}+z^{-60}))=+1$$
. $00\cdots011$ $00000001\times z^{0}$

Using the Rounding to Nearest Rule,
$$f(1+(z^{-51}+z^{-52}+z^{-60}))=+1\cdot 00\cdots011\times z^{0}$$
Therefore, $f((1+(z^{-51}+z^{-52}+z^{-60}))-1)=\cdot 00\cdots011\times z^{0}$

$$=z^{-51}+z^{-52}$$