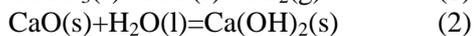
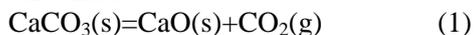


a)

It is impossible to produce water from calcium carbonate, but if you mean *what mass of water is necessary to treatment of 1 tonne of calcium carbonate to calcium hydroxide*, I found the solution (below).

The molar mass of calcium carbonate is $M(\text{CaCO}_3)=40+12+3*16=100 \text{ g/mol}$

We have $n(\text{CaCO}_3) = m(\text{CaCO}_3)/M(\text{CaCO}_3) = 1000000\text{g}/100\text{g/mol} = 10000 \text{ mol}$ of calcium carbonate.



According to the equation (1) and (2) we need one mol of water for 1 mol of calcium carbonate, hence we have:

$$n(\text{H}_2\text{O}) = n(\text{CaCO}_3) = 10000\text{mol}$$

The mass of water is:

$$m(\text{H}_2\text{O}) = n(\text{H}_2\text{O}) * M(\text{H}_2\text{O}) = 10000\text{mol} * 18\text{g/mol} = 180000 \text{ g} = 180 \text{ kg}$$

b) The mass of water that you need to add to the calcium oxide is equal to previous solution.

$$M(\text{water}) = 180 \text{ kg}$$

c)

The molar mass of calcium carbonate is $M(\text{CaO})=40+16=56 \text{ g/mol}$

According to the equation (1) and (2) we need 1 mol of CaO for 1 mol of calcium carbonate, hence we have:

$$n(\text{CaO}) = n(\text{CaCO}_3) = 10000\text{mol}$$

The mass of CaO is:

$$m(\text{CaO}) = n(\text{CaO}) * M(\text{CaO}) = 10000\text{mol} * 56\text{g/mol} = 560000 \text{ g} = 560 \text{ kg}$$