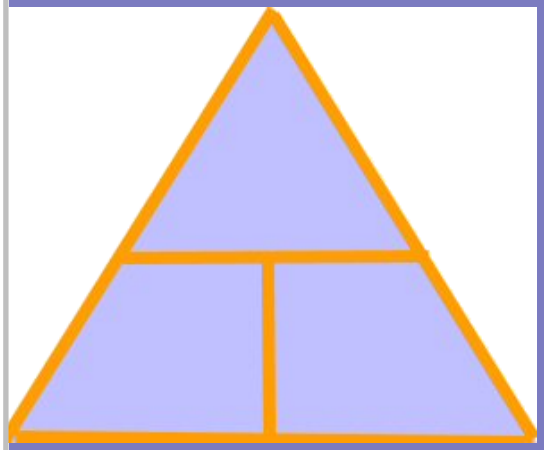
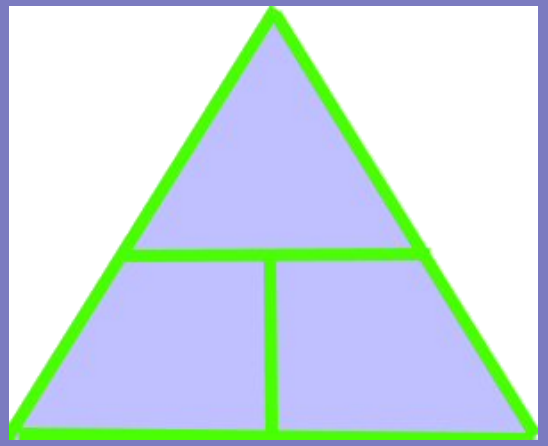
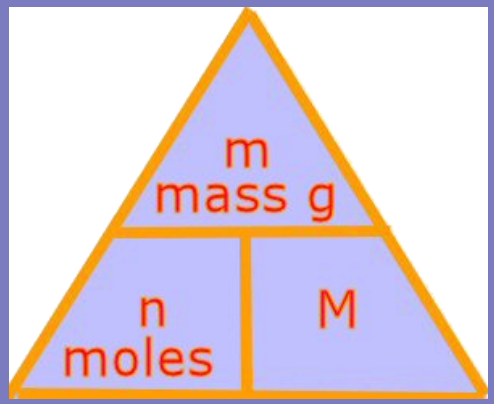
Worked Silly Questions

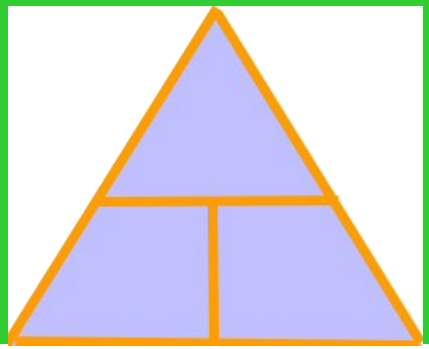
Q1 $2Na_2O_2 + 2H_2O \longrightarrow 4NaOH + 2H_2O + O_2$



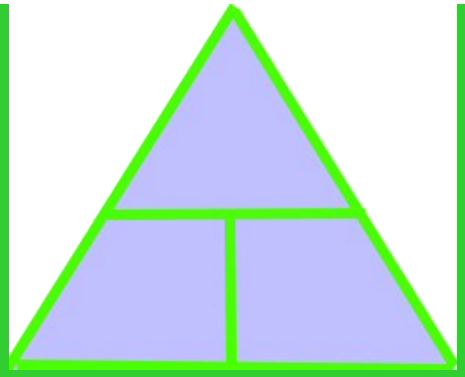


Calculate The mass of oxygen that will be produced by the reaction of 100g of sodium peroxide with water

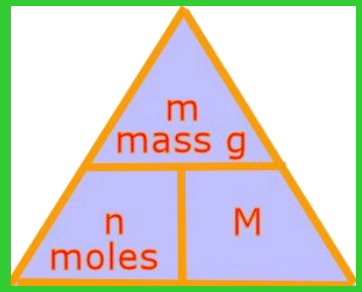




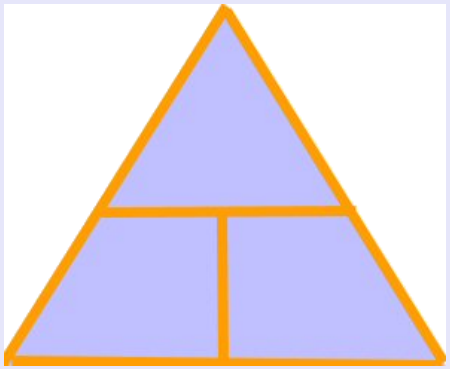
Q2 $2Al + 3H_2SO_4 \longrightarrow Al_2(SO_4)_3 + 3H_2$

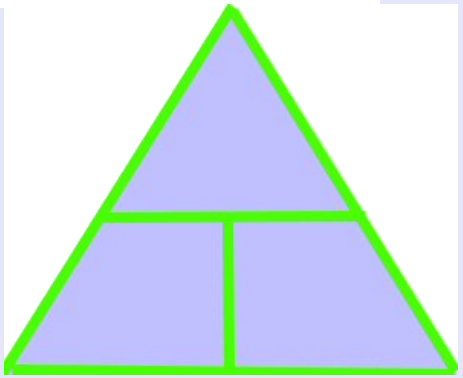


You are convicted of sleeping in a chemistry class, and placed in jail however, you notice that the bars are made of aluminium. What mass of sulphuric acid must you have in order that the 500g of aluminium is dissolved.

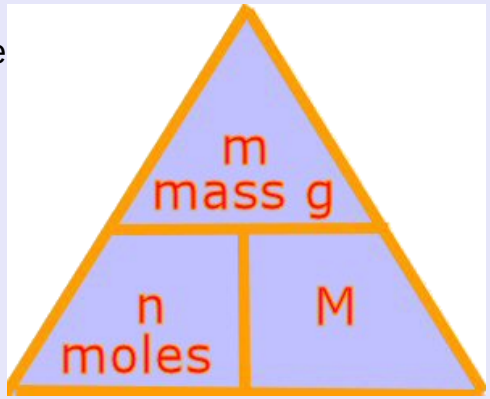


Q3 $2H_2O_2 \longrightarrow 2H_2O + O_2$

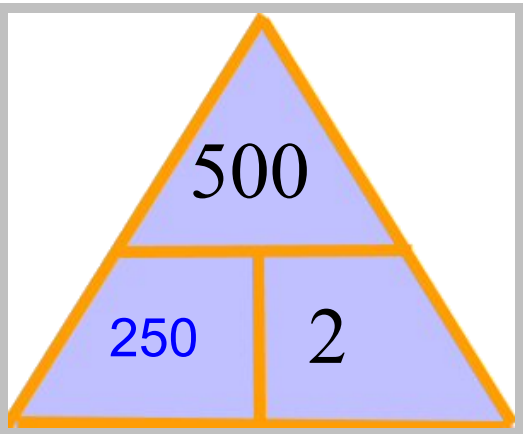


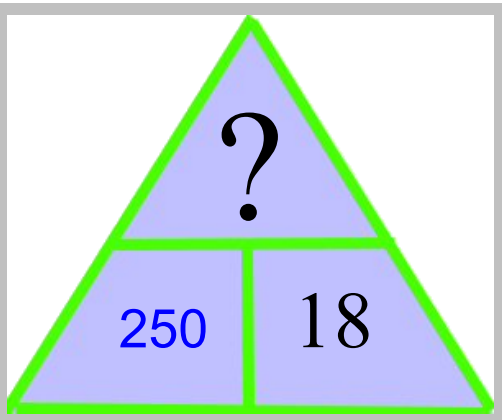


Congratulations, you have won a trip to a tropical island. But, when you arrive, you discover that there are no people on your island, they are on a neighbouring one that is too far for you to swim to. Just as you are about to try to swim the shark infested waters, you find a life raft with the words “inflate only with oxygen” written on the side, you then remember that you have some hydrogen peroxide with you (you were going to change the colour of your hair before you went home). If the raft needs 150g of oxygen for inflation, what mass of hydrogen peroxide would you need to have with you?

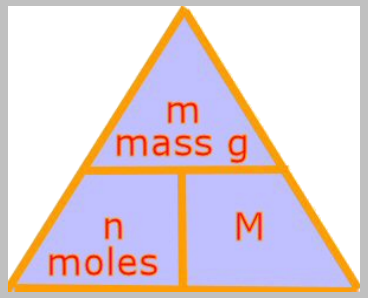


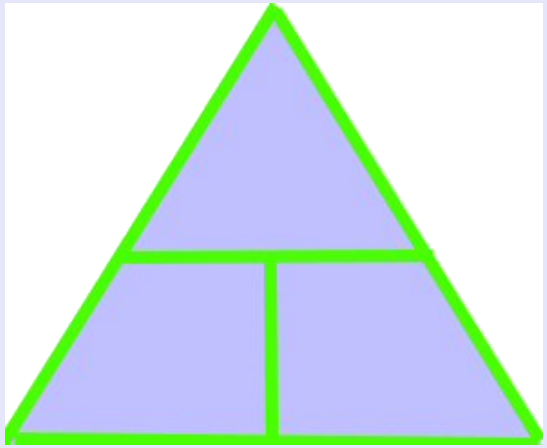
Q4 $2H_2 + O_2 \longrightarrow 2H_2O$



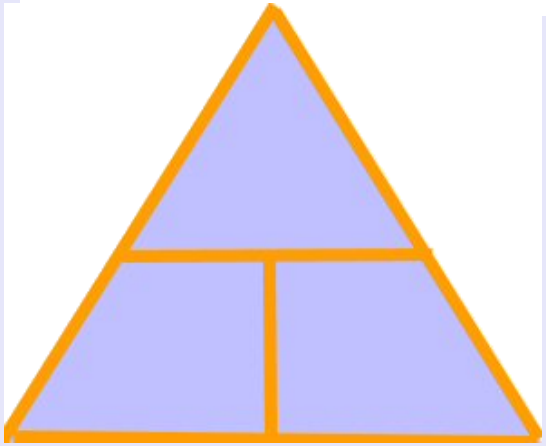


In your attempt to get off the island you are blown off course and are washed up on another beach. You are thirsty but you cannot find fresh water. Just as you are about to give up looking for a stream you find a cylinder containing 500g of hydrogen. You remember that the air contains about 20% oxygen and set about making the water that you need. Calculate the mass of water that could be produced by this reaction.



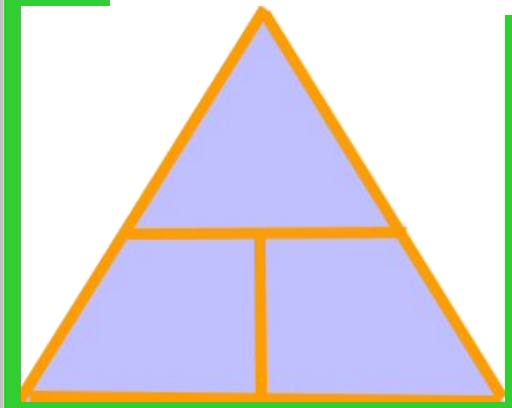


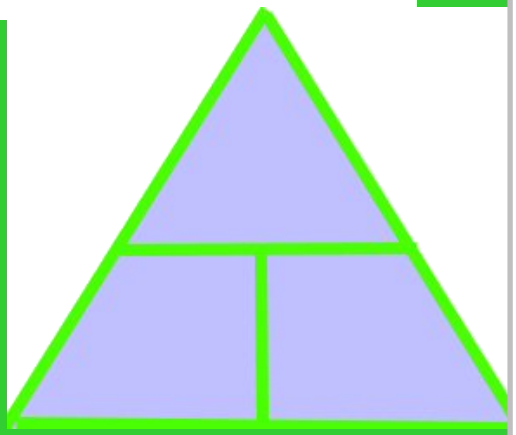
Q5 $CaCO_3 + 2HNO_3 \longrightarrow Ca(NO_3)_2 + H_2O + CO_2$



Unfortunately the experiment blows up and you are left dazed and wandering, not remembering who you are or where you come from. From over the sand hills come a tribe of hostile natives and take you prisoner and place you in a hut that has a limestone floor. In the corner of the hut is a large vat of nitric acid that is going to be used to dissolve guess who. In your frantic efforts to escape you notice that the floor sounds hollow. In a flash, your memory returns, you do a quick calculation and estimate that in order to escape you will need to dissolve 3000g of limestone (calcium carbonate) what mass of nitric acid must be in the vat?

$$2Na + 2H_2O \dashrightarrow 2NaOH + H_2$$





It works! You dissolve a hole in the floor and find yourself in a cave with a stream flowing through it. You drink and then follow the stream out to the sea, find your inflated life raft and make a dash for a passing ship. You are rescued! OR are you? On the ship is your old chemistry teacher who makes you spend your free time doing problems and making him coffee. Just as you are making him the 452nd cup of coffee, you find a jar containing 230g of sodium and estimate that if you could produce 24g of hydrogen gas you could blow him onto the island with the natives. Can you produce enough hydrogen by reacting the 24g of sodium with water to rid the ship of this wonderful person, or will you have more problems?