ROSEDALE ACADEMY

SBI4U 2-2: Pyruvate Oxidation & Citric Acid Cycle Worksheet

1. Pyruvate oxidation and the citric acid cycle occur in this organelle_____.
2. Pyruvate oxidation begins with the products of glycolysis, ____ molecules of _____.
3. In pyruvate oxidation, each pyruvate molecule is converted to _____ , in the process _____ molecules of NADH are produced from each pyruvate molecule.
4. In the first reaction of the citric acid cycle, _____ reacts with acetyl coA to produce citrate. The citrate is then converted to succinyl coA, in the process, _____ NADH are produced.
5. Succinyl coA is transformed into succinate, in the process, one molecule of _____ is formed, this molecule then goes on to produce _____ molecule(s) of ATP.
6. _____ molecule(s) of $FADH_2$ is produced during one turn of the citric acid cycle, this is used to ultimately produce _____ molecules of ATP.
7. In the final series of reactions, fumarate is converted to oxaloacetate, in the process _____ molecule(s) of NADH is produced.
8. Oxaloacetate is the final product of the citric acid cycle, it can then react with _____ to begin the cycle again.
9. For every molecule of glucose, _____ rounds of pyruvate oxidation and the citric acid cycle occur.
10. Write the net equation for pyruvate oxidation:

11. Write the net equation for the citric acid cycle:

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Part 2:
Complete the following table for the process pyruvate oxidation and the citric acid cycle for 1 molecule of glucose. Remember, that one molecule of glucose produces 2 pyruvate molecules at the end of glycolysis. Therefore, one molecule of glucose will generate 2 pyruvate oxidation reactions and 2 turns of the citric acid cycle.

Pyruvate Oxidation and the Citric Acid Cycle

(From 1 molecule of glucose)	**Pyruvate Oxidation**	**Citric Acid Cycle**
ATP molecules produced		
NADH produced		
$FADH_2$ produced		
Overall Energy Yield	**ATP_____** **NADH_____** **$FADH_2$_____**	**ATP_____** **NADH_____** **$FADH_2$_____**