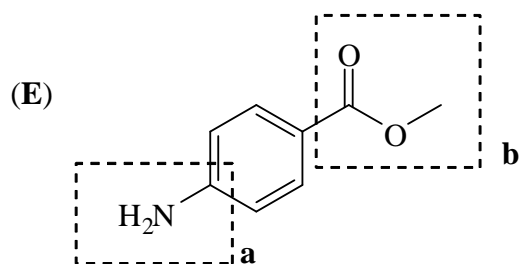


- The structure of methyl 4-aminobenzoate, (**E**), is given below.



Give the molecular formula of compound (**E**).



Name the functional groups in molecule (**E**) indicated by the boxes “**a**” and “**b**”.

a: amine

b: ester

Give the structure(s) of all organic products formed when compound (**E**) is treated with the following reagents. If no reaction occurs, write “NO REACTION”.

cold HCl (1 M)	<p>No hydrolysis of the ester under these conditions. The amine group will be protonated by the strong acid.</p>
hot NaOH (4 M)	<p>Treatment with base will lead to hydrolysis of the ester. In the basic solution, the carboxylic acid will be deprotonated and the amine will not be protonated.</p>
hot HCl (4 M)	<p>Hydrolysis of ester. In acidic conditions, the carboxylic acid will not be deprotonated and the amine group will be protonated.</p>