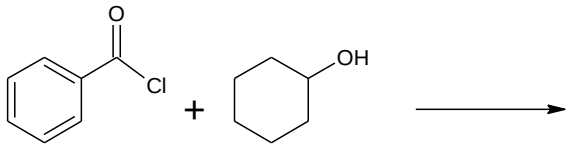
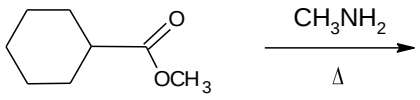
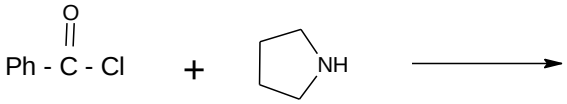
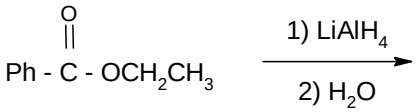
Carboxylic Acid Derivatives/Synthesis/Reactions Name: _____

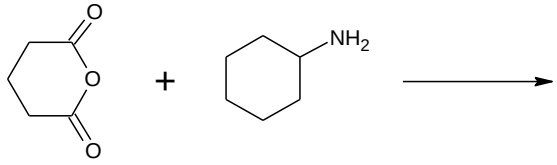
1. Predict the products of the following reactions.

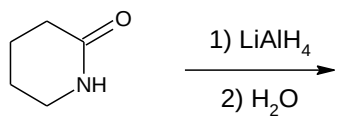
a) 

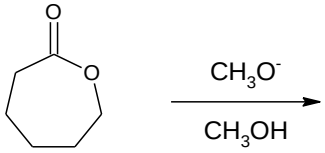
b) 

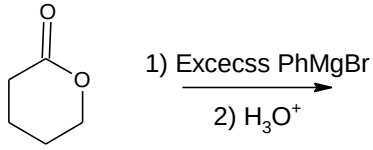
c) 

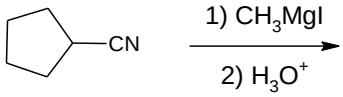
d) 

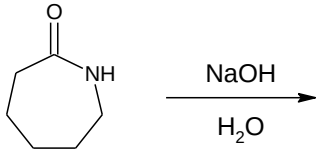
e) 

f) 

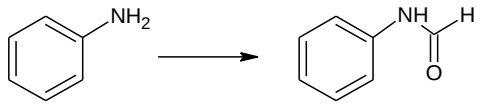
g) 

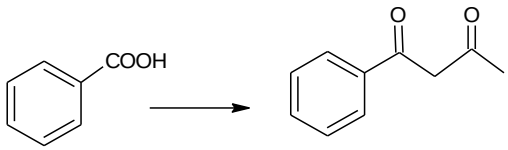
h) 

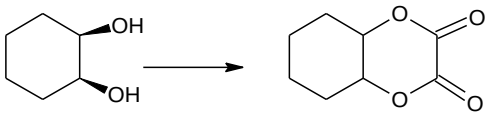
i) 

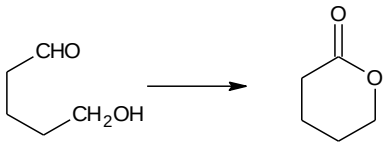
j) 

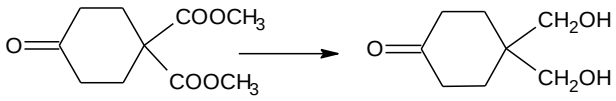
2. Show how you would accomplish the following synthesis in good yields.

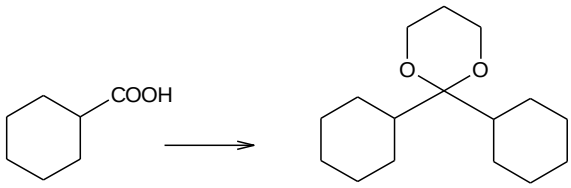
a) 

b) 

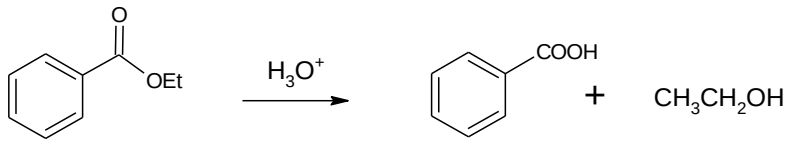
c) 

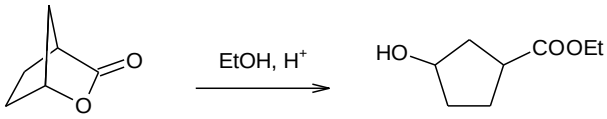
d) 

e) 

f) 

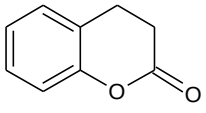
3. Propose the mechanism for the following reactions.

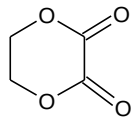
a) 

b) 

4. Predict the products of saponification of the following esters.

a) $CH_3CH_2COOCH_2CH_3$

b) 

c) 

5. Show how you would carry out the following synthesis. Don't forget, some conversions might require more than one step.

a) Isopentyl alcohol ⟶ isopentyl acetate (banana oil)

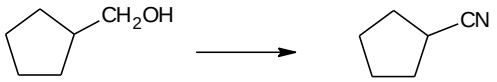
b) 3-ethylpentanoic acid ⟶ 3-ethylpentanenitrile

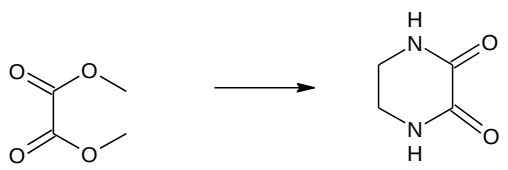
c) Isobutylamine ⟶ N-isobutylformamide

d) Ethyl acetate ⟶ 3-methyl-3-pentanol

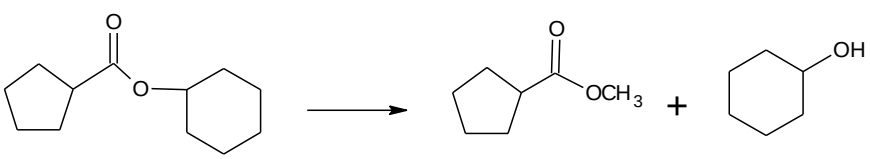
e) Cyclohexylamine ⟶ N-cyclohexylacetamide

f) Bromocyclohexane ⟶ dicyclohexylmethanol

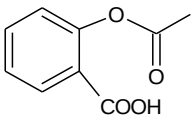
g) 

h) 

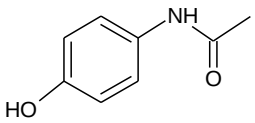
dimethyl oxalate

i) 

6. Show how you would synthesize aspirin and acetaminophen (both pain killers), from phenol.



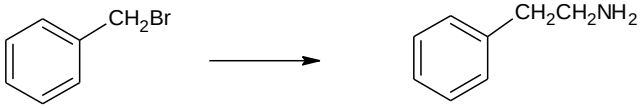
Aspirin



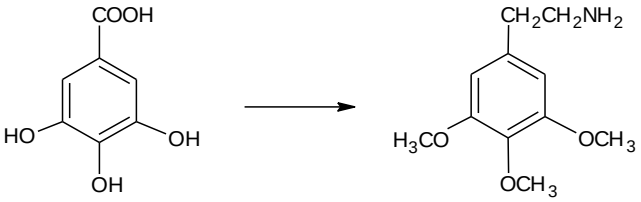
Acetaminophen

7. Show how you would accomplish the following multistep synthesis, using the indicated material and any necessary reagents.
   a) Methoxybenzene ⟶ p-methoxybenzamide

b)



c)



galic acid mescaline