1. a) \[
\begin{align*}
\text{CO}_2 \xrightarrow{\text{NaOH}} & \quad \text{C}_8\text{H}_8 + \text{isomers} \\
\downarrow \text{H}_2\text{O} \text{, H}_2\text{O workup}
\end{align*}
\]

b) same route as above but start w/ \[
\begin{align*}
\text{HC} - \text{OH}
\end{align*}
\]

c) same route as above but use \[
\begin{align*}
\text{N}_2\text{O}_4 \text{ or } \text{N}_2\text{Cl}_4
\end{align*}
\]

instead of \[
\begin{align*}
\text{H}_2\text{O}
\end{align*}
\]

d) use friedel-crafts rxn (borrowed from ibuprofen synthesis).

\[
\begin{align*}
\text{OH} \xrightarrow{\text{AlCl}_3} & \quad \text{C}_8\text{H}_8 \text{OH} \\
\downarrow \text{H}_2\text{O} \text{, H}_2\text{O workup}
\end{align*}
\]
2) Follow normal synthetic routes for ibuprofen ... except...

a) start with

b) start with

REALTY, THIS PROBABLY WON'T WORK BECAUSE WE ARE ASKING FOR RXN AT THE C' P-position ... AND AT THE DISFAVORED META POSITION (?) COMPLETELY DIFFERENT ROUTE REQUIRED ... BEYOND OUR SCOPE.

c) use...

d) use ... ICI e) use ICI and instead of ICl

f) use ibuprofen "intermediate" and hydrazine reaction from celebrex synthesis
3. a) Follow celebrex synthesis but use:

\[
\begin{align*}
& \text{CH}_3-N-NH_2 \\
& \text{and}
\end{align*}
\]

b) use:

\[
\begin{align*}
& \text{EtO} \overset{\text{Cl}}{\text{Cl}} \text{Ph} + \text{Et} \\
& \downarrow \text{Na}^+ \cdot \text{Et}^+ \text{(Base)}
\end{align*}
\]

\[
\begin{align*}
& \text{EtO} \overset{\text{Ph}}{\text{Ph}} \\
& \downarrow \text{careful ester hydrolysis}
\end{align*}
\]

\[
\begin{align*}
& \text{HO} \\
& \downarrow \text{NH}_2
\end{align*}
\]
5. Attach ketone to solid support

Treated 3/3 different α-Chloro Ketones

Pool and split

3 × 3

Treated 3/3 different Amines

3 × 3

1. NaOH
2. DCC

R₄-NH₂

R₅-NH₂

R₆-NH₂

Makes a "library" of

How many members in the "library"?