1. Draw the claisen product formed from each ester.

a. 

\[
\text{\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,0) -- (1.5,0);
\draw (0,0) -- (0,1.5);
\draw (0,0) -- (-1.5,0);
\draw (0,0) -- (0,-1.5);
\end{tikzpicture}}\]

b. 

\[
\text{\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,0) -- (1.5,0);
\draw (0,0) -- (0,1.5);
\draw (0,0) -- (-1.5,0);
\draw (0,0) -- (0,-1.5);
\end{tikzpicture}}\]

2. What compounds are needed to synthesize each compound by a crossed claisen reaction?

a. 

\[
\text{\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,0) -- (1.5,0);
\draw (0,0) -- (0,1.5);
\draw (0,0) -- (-1.5,0);
\draw (0,0) -- (0,-1.5);
\end{tikzpicture}}\]

b. 

\[
\text{\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,0) -- (1.5,0);
\draw (0,0) -- (0,1.5);
\draw (0,0) -- (-1.5,0);
\draw (0,0) -- (0,-1.5);
\end{tikzpicture}}\]
3. Draw the product formed from a Michael reaction with the given starting materials using \( \text{OEt, EtOH} \).

a.

\[
\text{acyl} + \text{alkene} \rightarrow \text{product}
\]

b.

\[
\text{pentane} + \text{ester} \rightarrow \text{product}
\]

This reaction involves the addition of an enolate to double bond to an alpha, beta unsaturated carbonyl. The electrophile is the Michael acceptor (conjugated) and the nucleophile is the Michael donor (best are stabilized enolates) and the product is a 1/5 carbonyl compound.