For the given molecule (M=58), do you expect the more abundant peak to be \( m/z \) 15 or \( m/z \) 43? Explain.

\[
\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3
\]

For the given molecule (M=74), which peak do you expect to be most abundant: \( m/z \) 31, \( m/z \) 45 or \( m/z \) 59? Explain.

\[
\text{HO}\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3
\]

Explain why the mass spectra of methyl ketones typically have a peak at \( m/z \) 43. Provide the structure of this fragment.

How could you use mass spectrometry to distinguish between the following two compounds (M=73)? Provide structures (and \( m/z \) values) for the significant fragments expected.

\[
\begin{align*}
&\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2 \\
&\text{and} \\
&\text{CH}_3\text{CH}_2\text{CH}_2\text{NHCH}_3
\end{align*}
\]

What would be the \( m/z \) ratio for the fragment resulting from a McLafferty Rearrangement for the following molecule (M=114)? What fragment accounts for its base peak at \( m/z \) 57?

\[
\begin{align*}
&\text{CH}_3\text{CH}\text{CH}_2\text{CH}_3 \\
\text{and} \\
&\text{CH}_3\text{CH}\text{CH}_2\text{C}\text{CH}_3
\end{align*}
\]