If a polynomial \( p(x) \) is divided by one of its LINEAR FACTORS then the remainder is ___.

and

If \( x - \alpha \) is a factor of a polynomial \( p(x) \) then \( \alpha \) is a root of zero.

### Example 1
Is \( x - 7 \) a factor of \( x^2 - 2x - 25 \)?

\[
\begin{array}{c|cc}
2 & 1 & -2 & -25 \\
& 1 & 36 & \\
\hline
& 5 & (5) & \\
\end{array}
\]

\[
x + 5 \left( x - 7 \right) \]

### Example 2
Is \( 3x + 1 \) a factor of \( 6x^3 + 11x^2 - 3x - 2 \)?

\[
\begin{array}{c|c}
3x + 1 & 2 \\
& 2 \\
\hline
& 0 \\
\end{array}
\]

### Directions
Answer all 6 questions in this section. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided in each question to determine your answer. Note that diagrams are not necessarily drawn to scale. [6]

1. Determine if \( x + 7 \) is a factor of \( f(x) = x^3 + 3x^2 - 25x + 21 \):

\[
\begin{array}{c|c}
-7 & 1 & 3 & 2 & -21 \\
& \frac{-7}{} & 2 & 3 & \text{Rem} 3 & \text{Rem} 0 & \text{Rem} 321 \\
\hline
& & 1 & -4 & 3 & 0 & \text{Rem} 0 \\
\end{array}
\]

2. Determine if \( 3x - 2 \) is a factor of \( g(x) = 6x^3 + 5x^2 - 9x + 2 \):

\[
\begin{array}{c|c}
\frac{3x - 2}{x^2 + 4} & -1 \\
& \frac{-3}{} & 5 & -9 & 2 \\
\hline
& & \frac{-5}{} & \frac{-21}{} & 0 & \text{Rem} 1 \\
\end{array}
\]