2. Given the function $f(x) = 2x^4 + 3x^3 - 6x^2 - 13x - 6$

a) List all of the possible rational zeros of $f(x)$.

$p = -6$	$q = 2$	p/q
$\pm 1, \pm 2, \pm 3, \pm 6$	$\pm 1, \pm 2$	$\pm 1, \pm 2, \pm 3, \pm 1/2,$ $\pm 3/2$

b) Use synthetic division to find the actual zeros of $f(x)$ and complete the table below.

From graph: $-3/2, -1$ (double zero), 2

$$
\begin{array}{r|rrrrr}
-1 & 2 & 3 & -6 & -13 & -6 \\
+ & \downarrow & -2 & -1 & 7 & 6 \\
\hline
 & 2 & 1 & -7 & -6 & \boxed{0}
\end{array} \Rightarrow (x+1)
$$

$$
\begin{array}{r|rr}
-3/2 & 2 & 3 \\
+ & \downarrow & -3 \\
\hline
 & 2 & \boxed{0}
\end{array} \Rightarrow 2(x+3/2)
$$

$$
\begin{array}{r|rrrr}
-1 & 2 & 1 & -7 & -6 \\
+ & \downarrow & -2 & 1 & 6 \\
\hline
 & 2 & -1 & -6 & \boxed{0}
\end{array} \Rightarrow (x+1)
$$

$$
\begin{array}{r|rrr}
2 & 2 & -1 & -6 \\
+ & \downarrow & 4 & 6 \\
\hline
 & 2 & 3 & \boxed{0}
\end{array} \Rightarrow (x-2)
$$

Zero or Root	x-intercept	Linear Factor	Multiplicity
-1	$(-1, 0)$	$(x+1)$	2
2	$(2, 0)$	$(x-2)$	1
$-3/2$	$(-3/2, 0)$	$(x+3/2)$	1
The factored form of $f(x)$ is …	$f(x) = (2x+3)(x-2)(x+1)^2$		