$Q_c^3(x)$ Bifurcations

Let $Q_c(x) = x^3 + c$. Use phaser to answer these questions. Turn in at least one graph for each problem and find the $c$’s to 4 significant figures. All the $c$ values should be between $-1.7$ and $-1.9$.

1. Find the $c$ where a 3-cycle for $Q_c(x)$ begins. Look at $Q_c^3(x)$ on phaser. $-1.75$
2. Find the $c$ where $Q_c^3(x)$ has a critical point that is fixed. $-1.75468$
3. Find the $c$ where $Q_c^3(x)$ has a period doubling bifurcation. $-1.76653$
4. Find the $c$ where $Q_c^3(x)$ has a critical point which is eventually fixed. $-1.7903275$

Tangent bifurcation for $Q_c^3$ at $c = -1.75$
The origin is a critical point and is fixed when \( c = -1.75489 \).

\[ c = -1.76853 \] a point of period 2 has been produced.
$c = -1.76852$ the fixed point is still attracting.
\[ c = -1.7903275 \]

The critical point is eventually fixed.