§ 3.7 Technology Highlight: Polynomial and Rational Inequalities

Example: Solve the inequality $t^5 - 10t^4 + 35t^3 - 50t^2 + 24t > 0$.

This can be done by hand (see Example 8 in Coburn), but not all quintic polynomials can be approached this way, so let's explore the situation with a graphing calculator.

Press [Y=] and enter the left-hand-side as Y_1. Set the [WINDOW] to $x \in [0, 4.7]$, $y \in [-5, 5]$, and [GRAPH]. Use [TRACE] to find the solution:

$$t \in (0, 1) \cup (2, 3) \cup (4, \infty)$$

To help us visualize this, we can use the Shade function:

DRAW ([2nd] [PRGM]), 7:Shade *or* CATALOG ([2nd] [0]), Shade(

The arguments of the Shade function are

> lower function, upper function, left endpoint, right endpoint, pattern, density

Here, we try Shade(0,Y_1,0,5,1,2)

To clear the shading, use the ClrDraw command from the DRAW menu or CATALOG.

Exercise: Do Technology Highlight Exercise 1, pg. 311