**Advanced Challenge Level 2 Problem #16**   _____

Let f be the function defined by $f(x) = x^3 - 5x^2 + 3x + k$, where k is a constant.
Answer the following.  Show your work neatly organized.

1.  On what interval(s) is f increasing?

2.  On what interval(s) is the graph of f concave down?

3.  Find the value of k for which f has 11 as its relative minimum.