# MAT 331 Homework Exercises. Week 4 (Sep 25, 00).

**NOTE:** *Each exercise is worth 10 points and can be turned in at any time before its "expiration date". You can work on any number of problems per homework sheet (none to all, usually 5). However, at the end of the semester, we will expect you to have turned in at least 3/5 of the exercises assigned (approximately 25). If you do more, we will pick your best grades. If you do less, the missing grades will be counted as zeros. This will determine 20% of your final grade for the class.*

**#06 (exp. 10/12)** Find all the integer solutions of $4m + 3n = 11$. Once you have Maple do this, write some comments to explain what the output on your screen means. Then plot 50 points $(m_i, n_i)$ of your choice, such that $m_i, n_i$ are among the above solutions. On which kind of curve do they lie? Write the equation of the curve and plot it.

**#07 (exp. 10/12)** Consider the spiral defined by the parametric equations: $x(t) = (1 + t)\cos t$, $y(t) = (1 + t)\sin t$, for $t \in [0, 10\pi]$. Use `animatecurve` to create a movie that shows the drawing of this curve. Make the curve blue.

**#08 (exp. 10/12)** In the previous problem, the movie starts nice but then the spiral gets ugly. Why? *[Your grade will be heavily affected by your answer to this question!]* Fix the problem and make a better movie *(don't erase the old one)*.
Finally, produce a third movie that draws a similar spiral clockwise.

**#09 (exp. 10/12)** Fit the points $(-1.9, -4.7), (-0.8, 1.2), (0.1, 2.8), (1.4, -1.2), (1.8, -3.5)$ by means of a quadratic function $f(x) = ax^2 + bx + c$, using the least square method. First, do this step by step, as we did in class; then, use the built-in Maple command, described in the notes. Check that the two solutions agree.