Parametric Equations

Is two really better than one

For each set of parametric equations...1. Discuss acceptable values of t
2. State the domain and range
3. Put in rectangular form... (eliminate t)
4. Graph by hand
5. Check with the calculator.

1. $x = 1 - 2t$ and $y = 1 + t$
2. $x = t^2 + 1$ and $y = t^2 - 1$
3. $x = \sqrt{t}$ and $y = 3t + 4$
4. $x = 2\text{Sin } t$ and $y = 3\text{ Cos } t$
5. $x = \text{Cos } t - 2$ and $y = \text{Sin } t + 3$
6. $x = \text{Cos } 2t$ and $y = \text{Sin } t$
7. $x = t$ and $y = \sqrt{(t^2 - 2t + 1)}$ hint: factor
8. $x = \text{Sec } t$ and $y = \text{Tan } t$
9. $x = e^{2t}$ and $y = e^t$

For #10-13 eliminate the parameter and graph by hand. Don't forget to consider the domain and range.

10. $x = t$ and $y = 2t + 1$
11. $x = \text{Cos } t$ and $y = 2\text{Cos } t + 1$
12. $x = e^{-t}$ and $y = 2e^{-t} + 1$
13. $x = e^t$ and $y = 2e^t + 1$

A word problem to consider. Use the concept of vectors to write the parametric equations that describe the position of the ball at any time t.

14. **The center field fence is 10 feet high and 400 feet from home plate. If the baseball is hit when it is 3 feet above the ground at an angle of 23° to the horizontal with an initial velocity of 100 miles/hour (146 2/3 ft/sec) will it be a home run? The only other force acting on the ball is gravity. Write a set of parametric equations that represent the position of the ball at any time t.**