Vertex Form

Work within a small group to answer these questions. Do not race through the exercises on your own. Always make sure that your entire group feels good about a question and answer before you move to the next exercise. Ask your group mates for explanations if you feel uncertain about something, and offer your explanations to others when you understand an exercise but someone else may not.

1. Use graphing technology (not any formulas or algebra) to find the vertex of $y = 2.9x^2 - 48x + 150$.

2. Also for f defined by $f(x) = 2.9x^2 - 48x + 150$, find the y-intercept, the x-intercepts (if there are any), the domain of f, and the range of f. Again, only use graphing technology, not any algebra or formulas.

3. An object was launched from the top of a hill (at 30 feet above sea level) with an upward vertical velocity of 100 feet per second. The height of the object can be modeled by the function $h(t) = -16t^2 + 100t + 30$, where t represents the number of seconds after the launch. Assume the object landed on the ground at sea level. How high did the object get before it started to fall back down? How many seconds did it take to get that high? Find the answer using graphing technology, not any algebra or formulas.

4. Where is the vertex of $y = 3(x - 9.1)^2 - 3.6$?

5. Write the vertex form for the quadratic function f, whose vertex is $(1, 9)$ and has leading coefficient $a = -8$.

6. A graph of a function f is given. Use the graph to write a formula for f in vertex form. You will need to identify the vertex and also one more point on the graph to find the leading coefficient a.