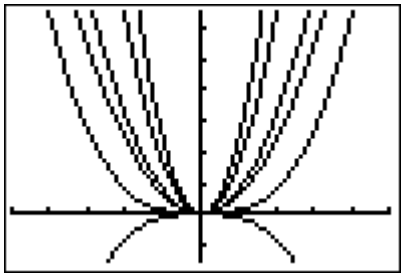
Chapter 2 Web Task Sample Solution

a) My design is for an etched glass vase.



b) I used the family $y = ax^3$ to show the outline of the vase. I needed two equations from this family, $y = x^3$ and $y = -x^3$.
For the lines to be etched into the upper part of the vase I used the family $y = ax^2$. I experimented with various values of a, to find ones that gave approximately equally spaced lines. The ones in my design are
$y = 6x^2$
$y = 8x^2$
$y = 16x^2$
$y = 24x^2$

c) The x-intercept of all functions that I used is at the origin.

e) To obtain a shape that I liked, I used $x \in [-5,5]$ and $y \in [-15,65]$, Yscl = 10.

f) Changing the domain alters the steepness of the sides of the vase. If I reduce the domain the outline of the vase becomes shallower. If I increase the domain the sides become steeper, that is, the vase would be narrower.