Quadratic Functions

Show work neatly on another sheet of paper.

Quadratic Forms	Names	Names
$y = ax^2 + bx + c$	Standard form	y-intercept $(0, c)$ doesn't help with graphing by hand
$y = a(x-h)^2 + k$	Vertex form	vertex (h, k) line of symmetry $x = h$ used to find x-intercepts y intercept $ah^2 + k$ finding max and min values: k helps for graphing by hand
$y = a(x-r_1)(x-r_2)$	Factor form	x-intercepts $(r_1, 0)$ $(r_2, 0)$ y-intercept $a(r_1)(r_2) = c$ because of symmetry $h = x$ coordinate of vertex $= \frac{r_1 + r_2}{2}$ Helps for graphing by hand (don't know min or max value)
If $a > 0$ then concave up $\cup$ If $a < 0$ then concave down $\cup$		Vertex is a min and k is the minimum value Vertex is a max and k is the maximum value

1. For each of the following
   State the vertex, State the y-intercept,
   Indicate if there is a maximum or minimum value and give the value
   Sketch the function without your calculator; include vertex and y-intercept
   From the sketch how many x-intercepts are there?

   a. $f(x) = (x-3)^2 + 5$

   b. $g(x) = -(x+2)^2 + 4$

   c. $h(t) = -7\left(t - \frac{1}{2}\right)^2 - \frac{13}{4}$

   d. $s(t) = 4(t+6)^2$

2. For each of the following complete the square to find the vertex and find all horizontal and vertical intercepts:

   a. $g(w) = w^2 + 2w + 3$

   b. $h(t) = 2t^2 + 12t + 9$