

6. [5 points] Let  $f(x) = -4x^2 + 12kx - 17$ . Use the method of completing the square to rewrite this function in vertex form and then give the coordinates of the vertex.  
*Show your work step-by-step. Note: Your answers may involve the constant  $k$ .*

**Vertex form:** \_\_\_\_\_

**Vertex:** \_\_\_\_\_

7. [10 points] Consider the function  $q$  defined by  $q(x) = \begin{cases} 3(0.75)^x & \text{if } x \leq -1 \\ 2(x+1)^2 - 8 & \text{if } -1 < x < 2 \end{cases}$

a. [2 points] Evaluate  $q(q(0))$ .

b. [4 points] Sketch a graph of  $y = q(x)$ . Carefully label your axes and important points on your graph (including intercepts).

c. [4 points] Find the domain and range of  $q$ . (Use either interval notation or inequalities.)

**Domain:** \_\_\_\_\_

**Range:** \_\_\_\_\_