1. Given the rational function \( g(x) = \frac{2x - 4}{x + 4} \),

   a) (1pt) Find the domain;
   \[ x \neq -4 \]

   b) (2pts) Find the \( x \) and \( y \) intercepts in coordinates forms;
   \[ x \text{-int: } (2, 0) \]
   \[ y \text{-int: } (0, -1) \]

   c) (2pts) Find the equations of all vertical asymptotes;
   \[ x = -4 \quad \text{no } x \text{ or have } y : \]

   d) (2pts) Find the equations of all horizontal asymptotes if any;
   \[ y = 2 \quad \text{no } y \text{ or have } x : \]

   h) (3pts) Use previous results and additional points if necessary to sketch the graph.
2. Given the quadratic function \( f(x) = -x^2 - 4x + 1 \),

a) (2pts) Find the vertex:
\[
h = -\frac{-4}{2(-1)} = -2, \quad k = -(-2)^2 - 4(-2) + 1
\]
\[
= -4 + 8 + 1 = 5
\]
\([-2, 5]\)

b) (2pts) Find the vertex form:
\[-(x + 2)^2 + 5\]
Wrong sign: 

-1

c) (1pt) Find minimum or maximum.
\[\max: 5\]

-1

d) (1pt) State the range;
\[-\infty, 5\]
No partial credit

-1

e) (2pts) Describe how the graph of \( f(x) \) can be obtained from the graph of \( y = x^2 \) using the transformations;

1. Shift left 2 units
2. Reflect about X-axis
3. Shift up 5 units
Wrong order: 
Incomplete: 

-1

-1

f) (2pts) Use transformations in part e) to Sketch the graph. (you may check your answer by referring to the results in part a) to d))

Wrong but consistent with previous pts: OK.