Directions: Please show all work since partial credit is given, and answers without the necessary work will receive no credit. Remember, relax and have fun!

1. Find the domain of each function. Write your answer in set builder notation or interval notion.

   a) \( f(x) = \frac{3x-4}{x+2} \)
      \[ \{ x \mid x \neq -2 \} \]

   b) \( f(x) = \sqrt{2x+9} \)
      \[ \left[ -\frac{9}{2}, +\infty \right) \]

2. At a time \( t \) seconds after a stone is tossed vertically upward, it reaches a height \( h \) in feet given by the function \( h(t) = 8 + 40t - 16t^2 \).

   a) How many seconds does it take the object to reach its maximum height?
      \[ t_{\text{vertex}} = \frac{-b}{2a} = \frac{-40}{2(-16)} = \frac{40}{32} = \frac{5}{4} \approx 1.25 \text{ seconds} \]

   b) What is its maximum height of the stone?
      \[ h\left( t_{\text{vertex}} \right) = h\left( \frac{5}{4} \right) \]
      \[ = 8 + 40\left( \frac{5}{4} \right) - 16\left( \frac{5}{4} \right)^2 \]
      \[ = 8 + 50 - 25 \]
      \[ = 33 \text{ feet} \]
3. Consider the piecewise-defined function \( f(x) = \begin{cases} 
  x^2, & \text{if } x < -2 \\
  2x - 5, & \text{if } -2 \leq x \leq 0 \\
  \sqrt{x} + 1, & \text{if } x > 0 
\end{cases} \) 

a) Evaluate the following:

\[
\begin{align*}
  f(-5) &= \frac{(-5)^2}{2-5} = 25 \\
  f(-2) &= \frac{-9}{2} \\
  f(2) &= \sqrt{2+1} \approx 2.41
\end{align*}
\]

b) Sketch a graph of \( f(x) \).