Graphing in Chapter 1

\[ y = a \cdot f(mx + b) + k \]

Find the domain
Find the y-intercept
Find the x-intercept(s)
Plot a test point if needed
Another good point to plot is y evaluated at \(-\frac{b}{m}\), if possible.

This will represent “horizontal” points on graphs of the form \( y = a(mx + b)^n + k \)

Use the basic shape of the graph of \( f \) to complete the graph of the original function.

Sketch the graph of \( y = -2\sqrt{x+4} + 2 \), finding and labeling all intercepts and asymptotes.

In this case, the parent function, or **basic function** is \( f(x) = \sqrt{x} \)

**Domain:**
\[ x + 4 \geq 0 \]
\[ x \geq -4 \]
\[ [-4, \infty) \]

**y-intercept:**
\[ y = -2 \]

**x-intercept(s):**
\[ -2\sqrt{x+4} + 2 = 0 \]
\[ -2\sqrt{x+4} = -2 \]
\[ \sqrt{x+4} = 1 \]
\[ x + 4 = 1 \]
\[ x = -3 \]

Check answer: Is it true that \(-2\sqrt{-3+4} + 2 = 0\) ? yup

Also plot \( \left(-\frac{b}{m}, k\right) = (-4, 2) \)

(In chapter 1, there are no asymptotes)