**A-SSE Graphs of Quadratic Functions**

**Task**

a. Graph these equations on your graphing calculator at the same time. What happens? Why?

\[
y_1 = (x - 3)(x + 1) \\
y_2 = x^2 - 2x - 3 \\
y_3 = (x - 1)^2 - 4 \\
y_4 = x^2 - 2x + 1
\]

b. Below are the first three equations from the previous problem.

\[
y_1 = (x - 3)(x + 1) \\
y_2 = x^2 - 2x - 3 \\
y_3 = (x - 1)^2 - 4
\]

These three equations all describe the same function. What are the coordinates of the following points on the graph of the function? From which equation is each point most easily determined? Explain.

1. vertex: _____
2. y-intercept: _____
3. x-intercept(s): _____

c. Make up an equation for a quadratic function whose graph satisfies the given condition. Use whatever form is most convenient.
i. Has a vertex at \((-2, -5)\).

ii. Has a \(y\)-intercept at \((0, 6)\)

iii. Has \(x\)-intercepts at \((3, 0)\) and \((5, 0)\)

iv. Has \(x\)-intercepts at the origin and \((4, 0)\)

v. Goes through the points \((4, 2)\) and \((1, 2)\)