**Required Functionality – Functional Requirements**

**Login System**

* **Upon runtime, this system shall display all the registered users in the database.**
  + All usernames must be clickable and will lead the user into the password entry activity, which they will enter the password to continue.

**Password Entry System:**

* T**he system shall log the user into the game upon entering valid user information**
  + The user must be registered into the system.
  + When the user enters information that is not in the database, they will receive an error dialog that prompts them to “register” or to “try again” which brings them to either the registration activity or cancel the dialog message.

**Registration System**

* **The system shall place the user information into the user database, if the information is ‘valid’.**
  + Validity is defined as such:
    - The user has not already been registered into the system.
    - The first name entered only contains alphabetical characters (A-Z, a-z) in their first name. All other characters invalidate the username.
    - The username only contains alphanumeric characters and underscores.
    - The password must include: At least 1 Uppercase letter, 1 Lowercase letter and 1 number. All other characters, or the exclusion of any of the characters listed will invalidate the password.
  + If all the inputs are “valid”, the system will notify the user via a “Toast” message that will tell them that the system has correctly placed their information in the database.
  + If one of the inputs are “invalid,” The system will display a dialog message notifying the user which of the fields have the invalid input, and will prompt the user to either go back to the main menu, or try again (dismiss the prompt).
  + If the username, and first name already exist in the system, but under a different password, a dialog will appear that will ask the user if they want to switch passwords. This will be a yes-or-no dialog and choosing yes will activate a prompt to enter the “old” password and “a new password”
    - If the old password is in the database under the username, the stored password will be changed to the new password, and a dialog will notify the user that their password has been changed.
    - If the old password is incorrect, or the password is invalid, the system will display a different dialog that will notify them that the password change has been unsuccessful. The dialog will prompt them to either try again or go back to the registration menu.

**Learning System**

* **This system shall provide a list of clickable topics which brings up information about the topic as (videos, images, etc.)**
* **The system shall provide a set of examples, in which a few are filled out and the few are blank.**
  + Upon the user filling out all the blanks and switching screens or clicking the ‘solve’ button, the system shall check if the examples entered by the user are correct.
  + If the system deems the solutions to be correct, the topic will indicate change (in the form of either text color, borders, background or icon)
  + If the system deems the solution to be incorrect, no changes will be made.
* **Clicking the android back button from a specific topic page shall bring the user back to the list of topics, which they can choose another topic or return to the menu screen.**

**Practice System – Multiple Choice Infrastructure**

* **Upon clicking the ‘practice’ button,** **the system shall load up a set of questions related to the topic.**
* **After clicking one of these choices, the system shall launch the game.**
* **The game shall display a question, the lives of the user, 4 possible answers, and the experience gained from the current playthrough.**
  + When the user clicks on the correct answer, the user shall gain experience, and a new question will appear.
  + When the user clicks on a wrong answer, the user shall lose a life, and a new question will appear.
  + If the user takes too long to respond, the user shall lose a life, and a new question will appear.
  + Example Question: Differentiate / Answers: , , ,
* **When the user reaches 10 answers, the system shall end, rewarding the user with experience to be stored in their profile.**
* **When the user loses all their lives, the system shall display a dialog which displays how many questions they have answered correctly and how many experience they have achieved from the playthrough of the game.**
  + The user shall only receive a quarter of the experience, due to the loss
  + A dialog shall appear and prompt the user to either: go for another round or go back to the practice menu.
* When the user clicks on the android back button, **a dialog shall appear that asks the user if they want to quit. The system shall prompt the user to either continue the game or save the progress and return to the practice menu.**

**Profile System**

* **The system shall display the player character of the user, the username, and first name entered during the registration page.**
* **The system shall display 3 different fields for experience: Total XP, differentiation XP and Integration XP, Algebra XP, and Trigonometry XP.**
  + Total XP is defined as the sum of all the experience of the topics.
  + There will be a bar that shows the graphical interpretation of the XP bar.

**Achievement System**

* **The system shall display a list of achievements in the profile page, and will display all the ‘locked’ achievements as the grayed-out version of the achievement.** 
  + When an achievement is ‘locked,’ it means that it has not been achieved. After the achievement is unlocked, the achievement will be unlocked.
  + Any achievement that has been unlocked will display a message that notifies the user that they have unlocked an achievement.