Tutorial 1

2018

1   Sets

1. If $A = \{a, b, c, d, e, f\}$ and $B = \{e, g, u, d, w\}$:

    (a) What is $A \cup B$?

    (b) What is $A \cap B$?

    (c) What is $A \setminus B$?

    (d) What is $B \setminus A$?

2. If $A = \{x \in \mathbb{Z} | x^2 \leq 4\}$ and $B = [-5, 2)$

    (a) What is $A \cap B$?

    (b) Is $-2 \in A \setminus B$?

2   Functions

For each of the following functions, plot it in Julia. State its domain and range. Note any thing interesting about it. Are there any points where it reaches some maximum or minimum value?

1. $f(x) = x^2$

2. $g(x) = x^3$

3. $h(x) = e^{-x^2}$

4. $l(x) = \sqrt{9 - x^2}$

3   Inequalities

Solve the following inequalities for x

1. $2x + 4 > 2$

2. $x^2 < 9$

3. $\sqrt{x} > x^2$ (Hint: Use Julia to plot this)