MTH 166 Homework #1 Key

1a. not a function $(0,-2)$, $(0,1)$

b. not a function $(4,-3)$, $(4,3)$ (for example)

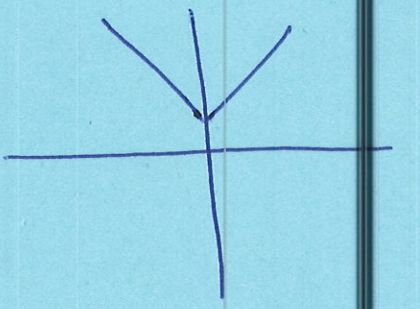
c. not a function $(0,-2)$, $(0,1)$

d. function

e. function

f. function

2. $f(x) = |x| + 1$



D: $(-\infty, \infty)$

R: $[1, \infty)$

3. a. D: $(-\infty,0) \cup (0,\infty)$ i.e. $x \neq 0$

R: $(-\infty,0) \cup (0,\infty)$ i.e. $y \neq 0$

Symmetry: odd

decreasing $(-\infty,0) \cup (0,\infty)$

no extrema (relative or otherwise)

b. $f(x) = x\sqrt{1-x^2}$ $\quad 1-x^2 \geq 0 \Rightarrow 1 \geq x^2 \quad x \geq -1, \ x \leq 1$

$-1 \leq x \leq 1$

D: $[-1,1]$

R: $[-1/2, 1/2]$

Symmetry: odd

decreasing $[-1, -1/\sqrt{2}) \cup (1/\sqrt{2}, 1)$

increasing $(-1/\sqrt{2}, 1/\sqrt{2})$

relative min at $(-1/\sqrt{2}, -1/2)$

relative max at $(1/\sqrt{2}, 1/2)$