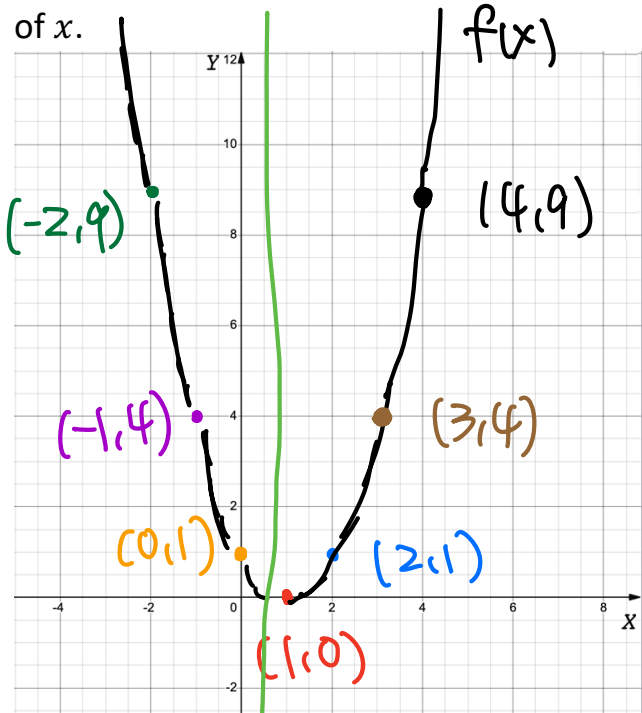ID:_____   Name:__Sol_____

- This quiz consists of 2 questions, each worth 5 points, for a total of 10 points.
- You have 10 minutes to complete the quiz.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

1. Given $f(x) = x^2 - 2x + 1$. Sketch f and use the vertical line test to explain f is a function of x.

① find some sketch points from f:

X	-2	-1	0	1	2	3	4
f(x)	9	4	1	0	1	4	9

$f(-2) = (-2)^2 - 2(-2) + 1$, $f(-1) = (-1)^2 - 2(-1) + 1$
$\quad\quad = 4 + 4 + 1 = 9$ $\quad\quad\quad\quad = 4$

(graph points labeled: $(-2,9)$, $(4,9)$, $(-1,4)$, $(3,4)$, $(0,1)$, $(2,1)$, $(1,0)$)

② For each vertical line, there is only one intersection point with the graph of f
⟹ f is a function

2. Given a function $f(x) = \dfrac{x+1}{x^2 - 7x + 10}$. Find the domain of f.

① Assume the domain of f is all real number $(-\infty, \infty)$

② Since f(x) is a fraction of two polynomials, then, those inputs x which make $f(x) = \frac{\bullet}{0}$ (undefined) have to be excluded from the domain (those inputs have no outputs)

③ Find x such that "$x^2 - 7x + 10 = 0$" ⟹ $(x-2)(x-5) = 0$
⟹ $(x-2) = 0$ or $(x-5) = 0$ $x = 2$, $x = 5$.

④ Take out 2 and 5 from $(-\infty, \infty)$, then the domain is
or $(-\infty, 2) \cup (2, 5) \cup (5, \infty)$