Name: _____ PID: _____

MATH 2: Midterm 2

Summer 2017

Instructions:

(1) Write your name and PID on the front of the exam.
(2) No calculators or other electronic devices are allowed during this exam.
(3) Read each question carefully, and answer each question completely.
(4) Show all of your work. No credit will be given for unsupported answers.

1	/10
2	/10
3	/10
4	/10
5	/10
Extra	/3
$\sum$	/50

Problem 1 (10 points)

a) Find the equation of the line containing $(4, 1)$ and $(7, -2)$.

b) Find the equation of the line containing $(1, 2)$, perpendicular to the line whose equation is given by:

$$y = -\frac{1}{3}x + \sqrt{37}$$

c) Find t such that the point $(t, 2t)$ is on the line $y = -x + 9$

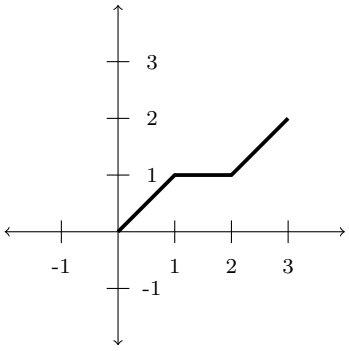
Problem 2 (10 points)

Let $f(x) = \sqrt{x-4} - 5$

a) Find the domain of f

b) Draw the graph of f

c) Suppose the graph of $g(x)$ is given below:



Find $g(0), g(1), g(2)$ and $g(3)$.

Problem 3 (10 points):
Find all intersection points between two graphs whose equations are given below:

$$y - x = 1$$
$$xy - 4x = 4$$

Problem 4 (10 points)

a) Solve for x:

$$ax^2 - 3ax - 2bx + 6b = 0$$

b) Simplify the following expression as much as possible:

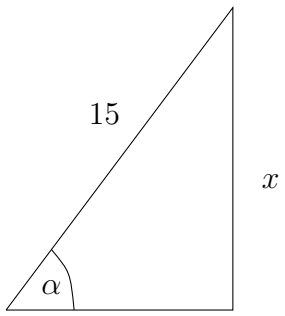
$$\frac{x^2 - 7}{x + \sqrt{7}}$$

Problem 5 (10 points)

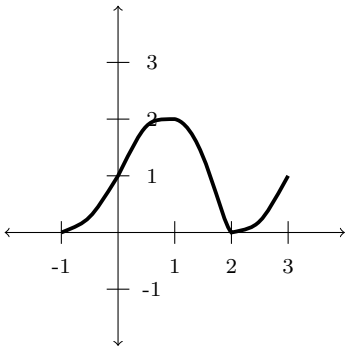
a) Convert $\frac{3\pi}{4}$ radians to degrees.

b) Compute $\sin\left(\frac{\pi}{6}\right)$ and $\cos\left(\frac{\pi}{2}\right)$.

c) Suppose α is the angle such that $\sin(\alpha) = \frac{4}{5}$. Find the length x from the diagram below:



Extra credit (3 points)
Suppose the graph of f is given below:



Find x that gives the maximum (largest possible) $f(x)$.