

1. Consider the points $(2, 1)$ and $(-1, 3)$ in the xy -plane.
- a) (1 pt) Plot these points on a coordinate plane.
 - b) (1 pt) Find the distance between these two points.
 - c) (1 pt) Find the location of the midpoints of the line segment which connect these two points.
 - d) (1 pt) Draw the line determined by these two points, and find its slope.
 - e) (1 pt) Find the slope-intercept form of the equation of the line drawn in d) .
 - f) (1 pt) What are the x - and y -intercepts of this line?

2. Solve the following two inequalities:

- a) (2 pts) $0 < 2 - x \leq 3$
- b) (2 pts) $\frac{1}{x+1} \geq \frac{2}{2x-1}$

3. (3 pts) Find the center and the radius of the circle $x^2 + 2x + y^2 - 4y - 4 = 0$, and sketch its graph.

4. (1 pt) Sketch the following region in the xy -plane.

$$\{(x, y) : x^2 + y^2 \leq 1, y > 0, x > 0\}$$

5. Consider the quadratic equation $y = 2x^2 - 12x + 16$.

- a) (2 pts) By completing the square, rewrite this equation in standard form.
- b) (2 pts) Find the x - and y -intercepts of the graph.
- c) (1 pt) Find the coordinates of the point that corresponds to the maximum or minimum value of
- d) (1 pt) Sketch the graph.

6. (2 pts) Find the domain of the function $h(x) = \frac{x+1}{\sqrt{x^2-x-2}}$.

7. (3 pts) A farmer wants to build a rectangular fence and has 1000 meters of fencing material with which to build the fence. The enclosed area will be next to a straight river, so the fence only needs to enclose 3 sides. Find the dimensions that will maximize the enclosed area.

8. Sketch the graphs of each of the following functions.

a) (1 pt) $f(x) = (x + 1)^2 - 1$.

b) (1 pt) $g(x) = 2|x| - 3$.

c) (1 pt) $h(x) = 2 - \sqrt{x}$.

d) (1 pt) $f(x) = |x^2 - 2|$.

9. (3 pts) Two people begin walking from the same point. One heads due north at 2 mph, and the other heads due east at 3 mph. Find a function $d(t)$ that represents the distance between the two people as a function of the time t in hours after they begin to walk.

10. (3 pts) Some values for two functions $f(x)$ and $g(x)$ are shown in the table below:

x	$f(x)$	$g(x)$
-2	3	3
-1	0	1
0	-1	-1
1	0	-3
2	3	-5

One function is linear and the other is quadratic. Determine which is which, and find an equation for each function.