

## GEOMETRY

- 1) Find the center and radius of the circle with equation  $x^2 + y^2 - 6x + 10y + 9 = 0$

- 2) Evaluate the piecewise function at the given values of the independent variable:

$$f(x) = \begin{cases} \frac{x^2 - 9}{3} & x \neq 3 \\ 6 & x = 3 \end{cases}$$

Evaluate at  $f(5)$ ,  $f(0)$ , and  $f(3)$ .

- 3) Let  $A(-7, 4)$  and  $B(5, -12)$  be points in the plane. Find the equation of the line through points A and B.

- 4) Find the domain of the piecewise function:

$$f(x) = \begin{cases} 0 & x < -4 \\ x^2 & x \geq 0 \\ -x & -4 \leq x < 0 \end{cases}$$

- 5) Sketch the region in the  $xy$ -plane defined by  $|x| < 4$  and  $|y| < 2$

- 6) Find the domain of  $g(x) = \frac{\sqrt{x-2}}{x-5}$

- 7) Identifying even and odd functions:

- $f(x) = x^3 - 6x$
- $g(x) = x^4 - 2x^2$
- $h(x) = x^2 + 2x + 1$

- 8) Find an equation for the line that passes through the point  $(2, -5)$  and
- has a slope of  $-3$
  - is parallel to the  $y$ -axis
  - is parallel to the line  $2x - 4y = 3$

### Circles

- Find the equation of the circle with its center at  $(1, -5)$  and radius of 3.
- Given the equation of a circle  $(x - 3)^2 + (y + 4)^2 = 3$ , find the radius and the center.
- Give the center and radius of the circle defined by  $x^2 + (y - 3)^2 = 9$ .
- Give the center and radius of the circle defined by  $3x^2 + 3y^2 = 9$ .
- Find the equation of the circle with center at  $(-6, -7)$  and  $r = 6$ .

### Parallel/Perpendicular

- Find the equation of the line containing  $(3, 0)$  and perpendicular to the  $x$ -axis.
- Find the equation of the line containing  $(-4, 5)$  and parallel to the  $x$ -axis.
- Find the equation of the line containing  $(0, -2)$  and parallel to the  $x$ -axis.
- Find the equation of the line containing  $(-4, 5)$  and parallel to the  $y$ -axis.
- Find the equation of the line that is parallel to the graph of  $y = 3x - 2$  and has the  $y$ -intercept  $(0, 3)$ .
- Find the equation of the line that is perpendicular to the graph of  $y = 5$  and has the  $y$ -intercept  $(2, 0)$ .
- Find the equation of the line that is perpendicular to the graph of  $x = -2$  and passes through the origin.