

1. Find the values of  $x$  that satisfy  $3x - 7 \leq 5$ . Graph the solution on a number line.
2. Find the values of  $x$  that satisfy  $|3 + 2x| < 4$ . Graph the solution on a number line.
3.
  - (a) Find the distance between the points  $(3, -2)$  and  $(-1, 2)$ .
  - (b) Find the distance between the points  $(-1, 1)$  and  $(5, -4)$ .
  - (c) Find the equation of the circle with center at  $(-1, 1)$  that passes through the point  $(5, -4)$ . Write the equation in standard form.
  - (d) Find the equation of the circle with center at  $(1, 1)$  that passes through the point  $(3, -2)$ . Write the equation in standard form.
  - (e) Is the point  $(3, 2)$  on the circle in Part (c)? What about the point  $(4, -5)$ ?
4. Find the center and radius of the following circles.
  - (a)  $x^2 - 2x + y^2 = 3$
  - (b)  $x^2 - 4x + y^2 - 2y = 4$
5. Graph the region  $\{(x, y) : x^2 + y^2 \leq 4 \text{ and } y \geq x\}$ .
6. In the following questions, use the function  $g(x) = \frac{1}{\sqrt{x^2 - x - 6}}$ . Simplify the solution, if possible.
  - (a) Find  $g(0)$ .
  - (b) Find  $g(5)$ .
  - (c) Find  $g(-1)$ .
  - (d) Find  $g(x^2)$ .
  - (e) Find  $g(x + 2)$ .
  - (f) Find the domain of the function  $g$ .
7. On a coordinate plane, shade the set of points that satisfy both the conditions  $x + y > 3$  and  $y \leq 2$ .
8. Graph of the functions:

A. $a(x) = (x + 3)^2 - 1$	B. $b(x) = (x - 3)^2 + 1$
C. $c(x) = (x + 1)^2 + 3$	D. $d(x) = (x - 1)^2 - 3$
9. Let  $f(x) = (x - 6)^2 + 12$ .
  - (a) State the domain and range of the function  $f$ .
  - (b) Why is  $f$  a function?
  - (c) Does  $f$  have any of the three symmetries discussed in class? If yes, state the kind of symmetry or symmetries.
10. In the following questions, give your final answer in slope-intercept form.
  - (a) Give the equation of the line that passes through the point  $(-1, 4)$  with slope  $-2$ .
  - (b) Give the equation of the line that passes through the point  $(2, 4)$  with slope  $\frac{1}{3}$ .

- (c) Give the equation of the line that passes through the two points  $(1, 2)$  and  $(-3, 4)$ .
- (d) Give the equation of the line that passes through the two points  $(2, 3)$  and  $(1, -2)$ .
- (e) Find the equation of the line that passes through the point  $(2, 2)$  and is parallel to the line  $y = 3x + 6$ .
- (f) Find the equation of the line that passes through the point  $(-3, 0)$  and is parallel to the line  $2x + 5y = 5$ .
- (g) Find the equation of the line that passes through the point  $(2, 2)$  and is perpendicular to the line  $y = 3x + 6$ .
- (h) Find the equation of the line that passes through the point  $(-3, 0)$  and is perpendicular to the line  $2x + 5y = 5$ .
- (i) Find the equation of the line that passes through the point  $(2, 2)$  and is perpendicular to the line  $y = 6$ .
11. For the following two questions, consider the function  $f(x) = x^2 - 6$ .
- (a) Find the  $x$ -intercept(s) of  $f$ . Write each intercept as an ordered pair  $(x, y)$ . If there are no  $x$ -intercepts, write "NONE."
- (b) Find the  $y$ -intercept(s) of  $f$ . Write each intercept as an ordered pair  $(x, y)$ . If there are no  $y$ -intercepts, write "NONE."
12. For the following two questions, consider the function  $f(x) = 2x^2 - 4x + 1$ .
- (a) Find the  $x$ -intercept(s) of  $f$ . Write each intercept as an ordered pair  $(x, y)$ . If there are no  $x$ -intercepts, write "NONE."
- (b) Find the  $y$ -intercept(s) of  $f$ . Write each intercept as an ordered pair  $(x, y)$ . If there are no  $y$ -intercepts, write "NONE."
13. Find the vertex of the parabola:  $f(x) = x^2 + 4x + 5$ .
14. Let  $f(x) = 100x^2$  and  $g(x) = 0.1x^3$ . For what values of  $x$  is  $f(x) \geq g(x)$ .