

**Please show all work and justify all answers on the blank paper provided.**

---

1. Use interval notation to list the values of  $x$  that satisfy each inequality.

a.  $x^2 + x - 1 < 5$ .      b.  $|x - 4| \leq 1$ .

2. Find all values of  $x$  that solve the equation  $|3x + 2| = 4$ .

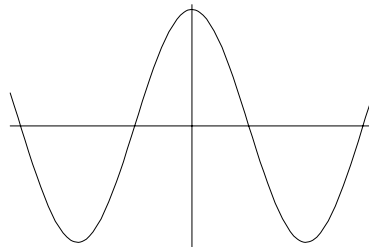
3. Indicate on an  $xy$ -plane those points  $(x, y)$  for which the following statement holds:

$$1 \leq x \leq 3 \text{ and } 2 < y \leq 4.$$

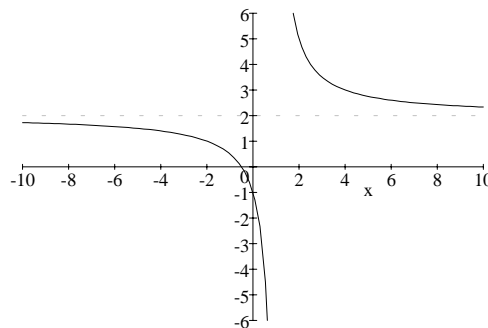
4. Complete the square on the  $x$  and  $y$  terms to find the center and radius of the circle represented by the equation

$$x^2 - 2x + y^2 - 4y = 4.$$

5. Specify all kinds of symmetry found in the graph below.



6. The figure below depicts the graph of  $y = g(x)$ . Use the graph to determine the domain and range of  $g$ .



7. Find the domain of the function having the formula  $h(x) = \frac{1}{\sqrt{x^2 - 2x}}$ .

8. Determine if each function is even, odd, or neither.
  - a.  $f(x) = |x| + 3x^2 + 5$
  - b.  $g(x) = |x| + x$
9. Find an equation for the line that passes through  $(2, 3)$  with slope  $-1$ .
10. Find an equation for the line that is tangent to the circle  $x^2 + y^2 = 13$  at the point  $(-2, 3)$ .
11. Sketch the graph of the quadratic equation  $y = x^2 - 6x + 8$ .