

**Intro to Calculus Test 1 Mr. Holcomb 2008/2009**  
**Best type of birthday cake?**

**Problem**

1. (8 points) For the following, write an English sentence about numbers on the number line and then describe the solution set (using interval notation if appropriate).

a.  $|x - 9| > 6$

b.  $|x + 9| \leq |x - 2|$

2. (4 points) Solve the following. Justify using concepts of absolute value.

a.  $|x - 6| > x - 6$

b.  $\sqrt[28]{(x - 3)^{28}} \geq 4$

3. (6 points) Find an inequality involving absolute value whose solution set is:

a.  $(-7, 0)$

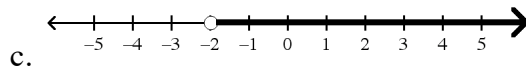
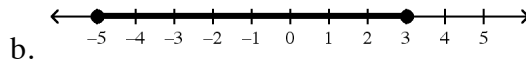
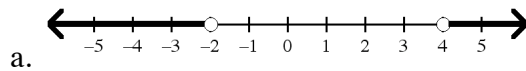
b.  $(-\infty, 4]$

4. (9 points) Translate the following into an algebraic statement using absolute value symbols:

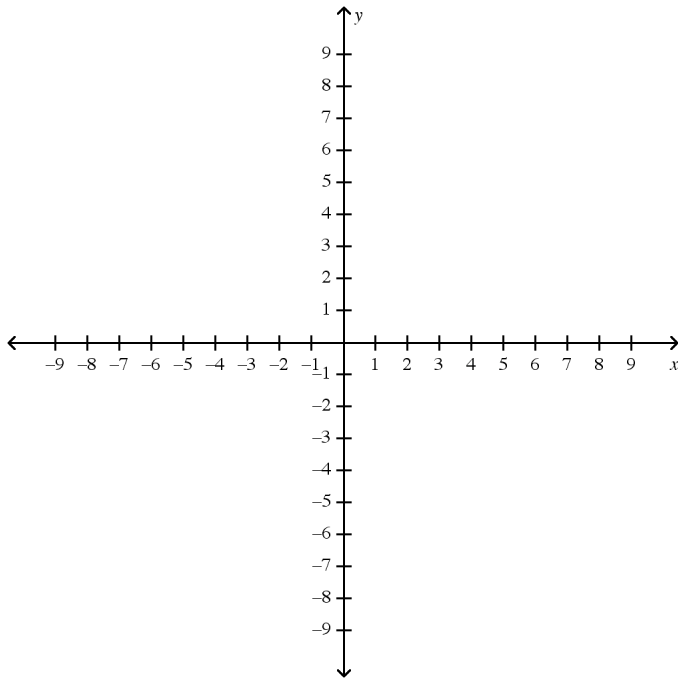
- a.  $x$  is a distance at least 6 units from 4.
- b. 6 is not more than 5 units away from  $x$ .
- c.  $x$  is closer to -4 than it is to -8.

5. (9 points) For each of the following:

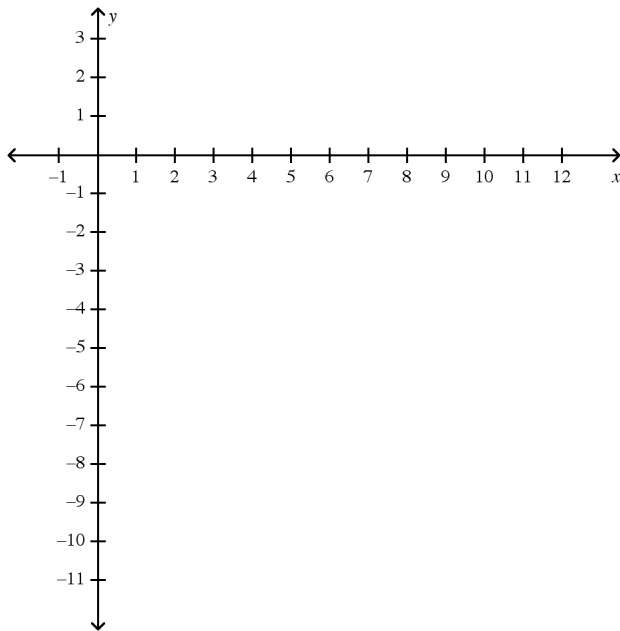
- i) Express the solution set shown using interval notation.
- ii) Find an inequality involving absolute value for each of the following number line graphs.



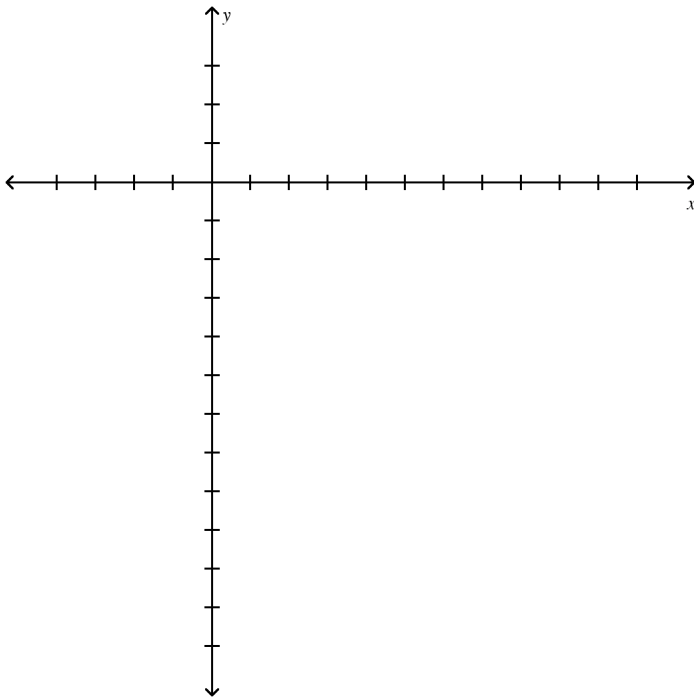
6. (8 points) Find the locations of all of the points which are 5 units away from the point  $(3,4)$  whose  $x$ -coordinate is  $-1$ . Justify with a graph and algebra.



7. (8 points) Find all of the points on the  $x$ -axis that are  $\sqrt{32}$  units away from the point  $(6,-4)$ . Justify with a graph and with algebra.



8. (8 points) Find an equation for the line that is tangent to the circle  $x^2 - 4x + y^2 + 10y + 3 = 0$  at the point  $(3,0)$ . Justify using a graph and algebra.



9. (8 points) There is a size of paper called foot paper that can be purchased. A sheet of foot paper has an area of one square foot. It is rectangular, and shaped so that if cut in thirds the result is three pieces that are each similar to the original piece of paper. What are the dimensions of a sheet of foot paper?