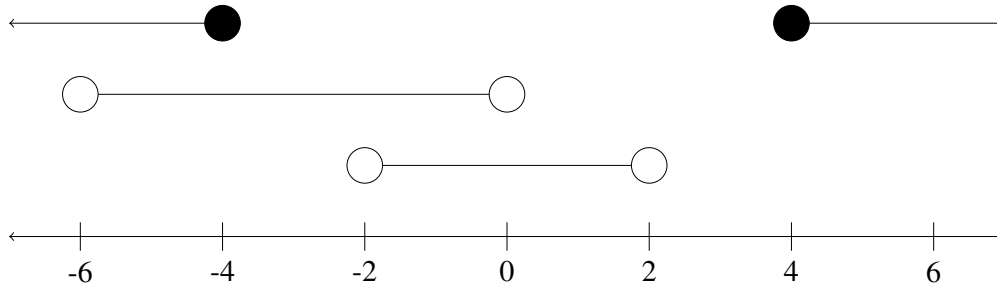


**Absolute Values and Inequalities****( /40 points)**

In the diagram below, I have graphed the solution sets according to 3 different inequalities involving **absolute values**. What are the 3 inequalities that I used? **Please circle your 3 answers.**



What is the solution set to the equation  $|3x + 2| = 4x + 5$  ?

What is the solution set to the inequality  $|5x - 15| \geq 20$  ?

What is the solution set to the inequality  $|2x - 4| \leq -4$  ?

**Sets, Relations, and Functions**

( /30 points)

State the definition of a **relation**.

State the definition of a **function**.

**For the following questions**, let  $A = \{cat, dog, hat\}$  and  $B = \{1, 2, 3, 4\}$ .

The relations described below have A as their domain and B as their range.

Is this relation a function:  $\{(cat, 1), (hat, 2)\}$  ? ( **Yes / No** )

If the answer is No, then explain why.

Is this relation a function:  $\{(cat, 1), (dog, 1), (hat, 1)\}$  ? ( **Yes / No** )

If the answer is No, then explain why.

Is this relation a function:  $\{(cat, 4), (dog, 2), (hat, 3), (hat, 1)\}$  ? ( **Yes / No** )

If the answer is No, then explain why.

**Linear Functions**

( /30 points)

Provide the equation of the line in **Standard Form** that satisfies the following conditions:

- Goes through the point (3,4)
- Is **perpendicular** to the line  $y = 2x + 329$

Provide the equation of the line in **Slope-Intercept Form** that satisfies the following conditions:

- Passes through the x-intercept at 5
- Is **parallel** to the line  $2x + 4y = 8$

**Extra Credit (Score cannot be over 100)**

( /5 points)

Consider the point  $p = (0, 10)$  and the line  $y = x/2$ . Which point on the line is closest to  $p$ , and how far away is that from  $p$ ?