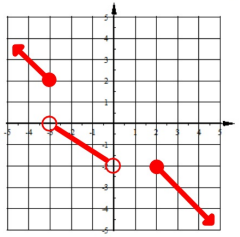
1. State the Domain and Range of the graph. Give your answer using inequalities.



Domain: $x<0,\ x\geq 2$

Range: $y<0,\ y\geq 2$

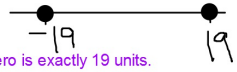
2. $2|x+9|-11=27$

$+11\quad +11$

$\frac{2|x+9|}{2}=\frac{38}{2}$

$|x+9|=19$

Get absolute value by itself first.



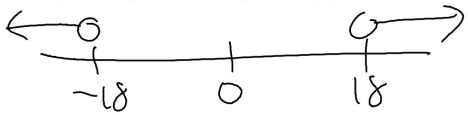

Distance from zero is exactly 19 units.

$x+9=19 \qquad x+9=-19$

$x=10,-28$

3. $|5x-4|>18$

distance from zero is more than 18 units.



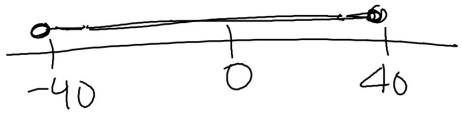

$5x-4<-18 \qquad 5x-4>18$

$5x<-14 \qquad 5x>22$

$x<-2.8$ or $x>4.4$

4. $|x-13|\leq 40$

distance from zero is less than 40 units




$-40\leq x-13\leq 40$

$+13 \qquad +13$

$-27\leq x\leq 53$

**Properties** **Absolute Value Inequalities**

Let $k$ represent a positive real number.

| | | |
|---|---|---|
| $\lvert x \rvert \geq k$ | is equivalent to | $x \leq -k$ or $x \geq k$. |
| $\lvert x \rvert \leq k$ | is equivalent to | $-k \leq x \leq k$. |

5. $|x + 8| + 15 < 6$

$-15 \quad -15$

$|x+8| < -9$ ← $k = -9$

Absolute value can't be less than -9!

NO SOL

$-k = +9$ ← $k$

$9 < x+8 < -9$

$-8 \quad -8 \quad -8$

$1 < x < -17$

AND

This graph has no solution for AND

$-17 \quad 1$