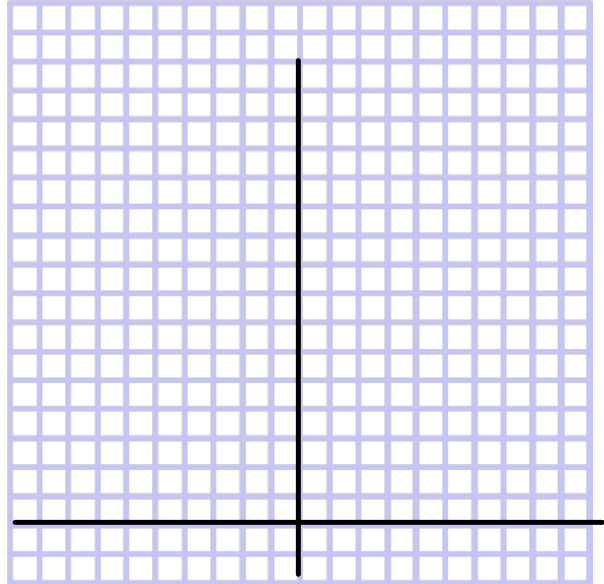


1.2: EXPLORING ABSOLUTE VALUE

$$f(x) = |x|$$

$$f(x) = \begin{cases} x, & x > 0 \\ -x, & x < 0 \end{cases}$$



Describe the transformation applied to the parent absolute value function to achieve $f(x) = |2x + 10| - 8$

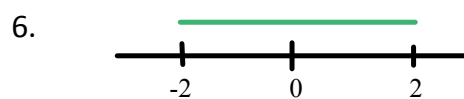
Describe the transformation applied to the parent absolute value function to achieve $f(x) = -2|3x - 1| + 4$

EXAMPLE: Express the following domains using absolute value notation.

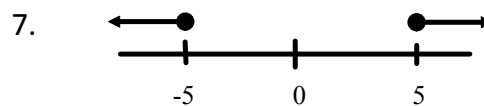
1. $-4 \leq x \leq 4$



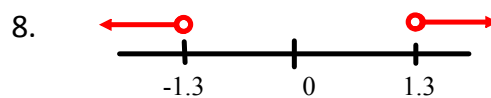
2. $-10 < x < 10$



3. $x < -8; x > 8$



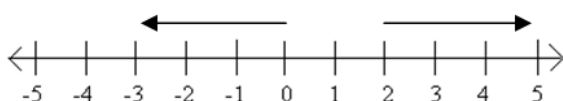
4. $x \neq 0$



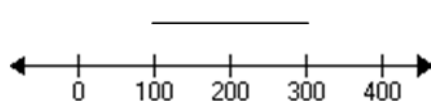
1.2: EXPLORING ABSOLUTE VALUE: *EXTENSION*

A. Rewrite using absolute value notation.

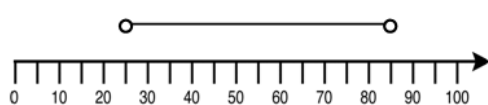
1.



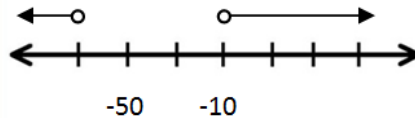
2.



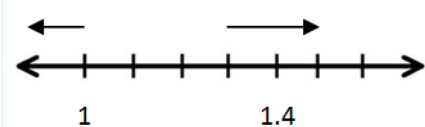
3.



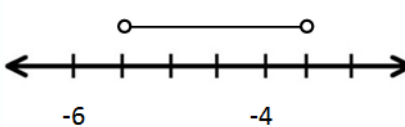
4.



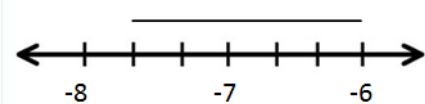
5.



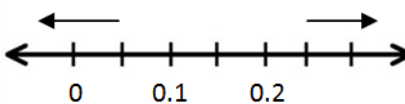
6.



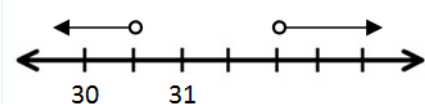
7.



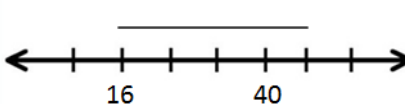
8.



9.



10.



B. Graph on a number line.

1. $|x - 4| \leq 3$

2. $|x + 10| > 5$

3. $|x + 2| < 4.5$

4. $|x - 5| \geq 5$

5. $|x - 0.6| > 1$

6. $|x + 150| \leq 0$

7. $|x - 2| > 0$

8. $|x - 8| \geq -8$

FURTHER Your Understanding

1. Arrange these values in order, from least to greatest:

$$|-5|, |20|, |-15|, |12|, |-25|$$

2. Evaluate.

a) $|-22|$

c) $|-5 - 13|$

e) $\frac{|-8|}{-4}$

b) $-|-35|$

d) $|4 - 7| + |-10 + 2|$

f) $\frac{|-22|}{|-11|} + \frac{-16}{|-4|}$

3. Express using absolute value notation.

a) $x < -3$ or $x > 3$

c) $x \leq -1$ or $x \geq 1$

b) $-8 \leq x \leq 8$

d) $x \neq \pm 5$

4. Graph on a number line.

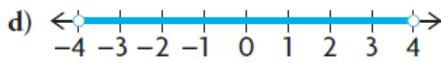
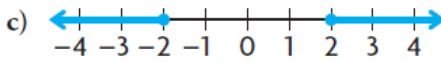
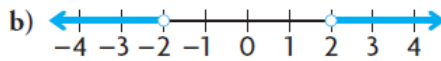
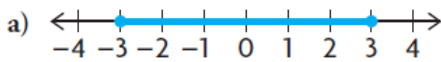
a) $|x| < 8$

b) $|x| \geq 16$

c) $|x| \leq -4$

d) $|x| > -7$

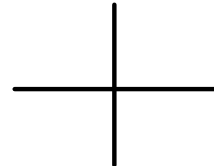
5. Rewrite using absolute value notation.



6. Graph $f(x) = |x - 8|$ and $g(x) = |-x + 8|$.

a) What do you notice?

b) How could you have predicted this?



7. Graph the following functions.

a) $f(x) = |x - 2|$

b) $f(x) = |x| + 2$

c) $f(x) = |x + 2|$

d) $f(x) = |x| - 2$

8. Compare the graphs you drew in question 7. How could you use transformations to describe the graph of $f(x) = |x + 3| - 4$?

9. Predict what the graph of $f(x) = |2x + 1|$ will look like. Verify your prediction using graphing technology.

10. Predict what the graph of $f(x) = 3 - |2x - 5|$ will look like. Verify your prediction using graphing technology.

2. Evaluate.

a) $|-22|$

c) $|-5 - 13|$

e) $\frac{|-8|}{-4}$

b) $-|-35|$

d) $|4 - 7| + |-10 + 2|$

f) $\frac{|-22|}{|-11|} + \frac{-16}{|-4|}$