Graphing Inequalities on a Number Line

Graphing inequalities on number lines: Models and calculations

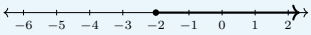
Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

An open circle excludes the boundary; a filled circle includes it. Shade left for $<$ or $\leq$, right for $>$ or $\geq$. A real measurement can also have a lower bound. For example, $0 < x \leq 3$ excludes 0 but includes 3.

Worked example

Graph $x \geq -2$ and test one value on each side.



1. Test the boundary: $x = -2$ is included, so use $\geq$.

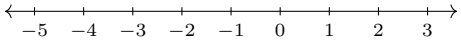
2. $-1 \geq -2$ is true, while $-3 \geq -2$ is false; the allowed side is right.

Answer: $x \geq -2$. Closed circle at -2; shade right.

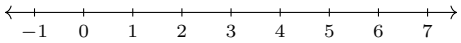
Practice Problems

Show your thinking.

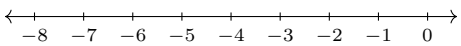
1. Graph $x > -1$; test the boundary and one value on each side.



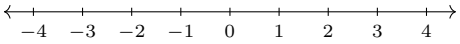
2. Graph $x \leq 3$.



3. Graph $x < -4$.



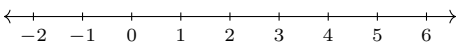
4. Graph all nonnegative numbers.



5. Let x be a ribbon length in meters. Show all positive lengths at most 5 m, labeling both endpoints.



6. Graph the values greater than 2.



Answer Key

1. $x > -1$. Open circle at -1; shade right.
2. $x \leq 3$. Closed circle at 3; shade left.
3. $x < -4$. Open circle at -4; shade left.
4. $x \geq 0$. Closed circle at 0; shade right.
5. $0 < x \leq 5$.
6. $x > 2$. Open circle at 2; shade right.

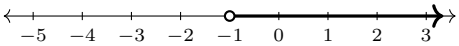
Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Test the boundary: $x = -1$ is excluded, so use $>$.

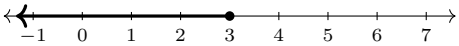
2. $0 > -1$ is true, while $-2 > -1$ is false; the allowed side is right.



Problem 2

1. Test the boundary: $x = 3$ is included, so use $\leq$.

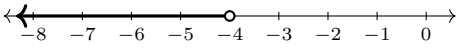
2. $2 \leq 3$ is true, while $4 \leq 3$ is false; the allowed side is left.



Problem 3

1. Test the boundary: $x = -4$ is excluded, so use $<$.

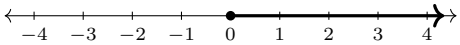
2. $-5 < -4$ is true, while $-3 < -4$ is false; the allowed side is left.



Problem 4

1. Test the boundary: $x = 0$ is included, so use $\geq$.

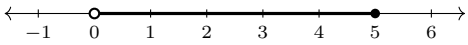
2. $1 \geq 0$ is true, while $-1 \geq 0$ is false; the allowed side is right.



Problem 5

1. The length must be positive, so use an open dot at 0.

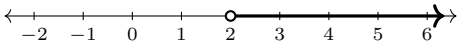
2. Put a filled dot at 5; the limit is allowed. Shade only between the dots.



Problem 6

1. Test the boundary: $x = 2$ is excluded, so use $>$.

2. $3 > 2$ is true, while $1 > 2$ is false; the allowed side is right.



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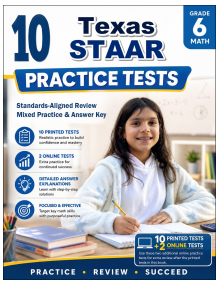

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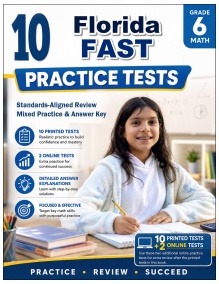

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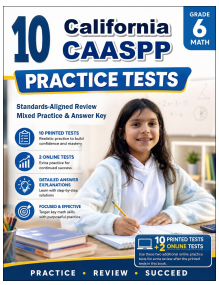

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