Appendix H:
Writing and Graphing Inequalities

TERMINOLOGY — APPENDIX H

For the following term, provide 1) a definition in your own words, 2) the formal definition (as provided by your text or instructor), and 3) an example of the term using a drawing or problem. A sample filled-out form is available in the Introduction.

Inequality

Your definition	
Formal definition	
Example	

READING AND SELF-DISCOVERY QUESTIONS — APPENDIX H

1. Inequality symbols are used to compare values. We use symbols to replace descriptive phrases such as "greater than" or "less than." Provide the symbols that match the following phrases:

   Greater than ___>___ Less than ___<___

   Greater than or equal to ___≥___ Less than or equal to ___≤___

2. Graphing the solution to an inequality on a number line requires the matching of inequality symbols with number line symbols. Complete the following discovery statements:

   If an inequality contains the $<$ or $>$ symbol, use the **open** or **closed** (choose one) circle. Draw an example of this kind of circle.

   If an inequality contains the $\leq$ or $\geq$ symbol, use the **open** or **closed** (choose one) circle. Draw an example of this kind of circle.

CRITICAL THINKING QUESTIONS — APPENDIX H

1. Using the relationship between the numbers 5 and 7 as an example, why is $7 > 5$ equivalent to $5 < 7$? Formulate your answer in general terms rather than referring specifically to the example.

   If a>b, then b<a. If a first number is bigger than a second number, then the second number is less than the first number.

2. Would the graph of $x \leq -\frac{1}{4}$ differ from the graph of $x \leq -0.25$? Why or why not?

The graphs are the same because the difference in the inequalities is not in the numbers, but in the representation of the numbers. -1/4 = -0.25

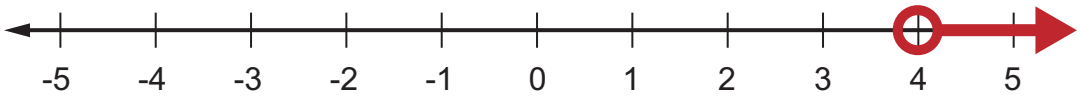
3. When should you use a closed versus an open circle when graphing inequalities on a number line? What do you think the reason is for this convention?

The open circle at a point indicates that the point is not in the solution set. A closed circle at a point indicates that the point is in the solution set. The empty circle would seem to mean that the point is omitted, while the closed circle would seem to indicate that the point is included.

DEMONSTRATE YOUR UNDERSTANDING — APPENDIX H

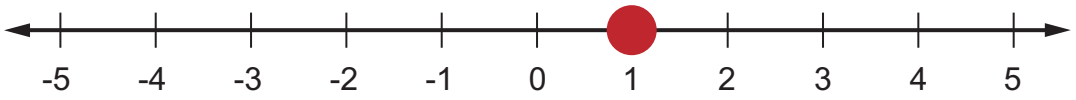
1. Graph each of the following expressions on the number line provided.

a) $x > 4$



b) $x \leq 3$

c) $x = 1$



IDENTIFY AND CORRECT THE ERRORS

Identify the error(s) you find in each of the following worked solutions. Describe the error made and solve the problem correctly in the appropriate spaces provided.

Problem

1. Graph the given inequality on a number line: $x \geq -1$

Worked Solution
(What is wrong here?)

Describe Error

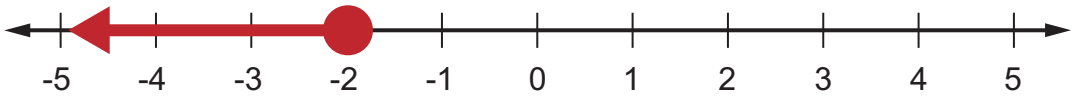
Student did not include the endpoint in the solution.

Correct Process

Problem

2. Graph the given inequality on a number line: $x \geq -2$

Worked Solution
(What is wrong here?)



Describe Error

The arrow is pointing in the wrong direction.

Correct Process