

Chapter 3 Student Success Sheet (SSS)

Solving Inequalities and Absolute Value

Olathe East High School – Intermediate Algebra

Name: _____
Hour: _____

Reminders:

- Homework is completed in **homework notebook only**.
- **All pages** in homework notebook should be labeled accordingly:
Unit _____ Concept _____ - (title of assignment)

Examples:

Unit 1 Concept 1 – Practice Quiz
Unit 1 Concept 1-4 – Practice Test

Need Help? Support is available!

www.mhollan.weebly.com

www.srushingoe.weebly.com

“Success has a simple formula:
do your best, and people may like it.”

Sam Ewing

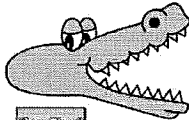
Concept #	What we will be learning...	Mandatory Practice
1	Graphing inequalities with one variable AND writing inequalities in one variable	Practice Quiz 1
2	Checking if a number is a solution to an inequality	Practice Quiz 2
3	Solving inequalities with addition and subtraction/graph and check solutions	Practice Quiz 3
4	Solving inequalities with multiplication and division/graph and check solutions	Practice Quiz 4
5	Solving multi-step inequalities/checking solutions (inequalities include distribution, variables on both sides, etc.)	Practice Quiz 5
6	Solving absolute value equations	Practice Quiz 6
7	<i>Solving absolute value inequalities (optional at end of year)</i>	Practice Quiz 7

#1

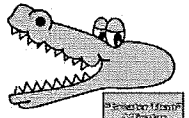
Graphing inequalities with one variable AND writing inequalities in one variable

Inequality symbols:

The **angry** man left the door **open** and dashed out.



$<$ _____ $<$ _____



$>$ _____ $>$ _____

On a number line (one variable only, any letter), we use circles...

The **sleepy** man **closed** his eyes and had a **solid** night's sleep.

A number line looks like this:

$<$ and $>$ use _____ like _____

\leq and \geq use _____ like _____

On a coordinate plane (one or two variables, must be x and y), we use lines...

A coordinate plane looks like this:

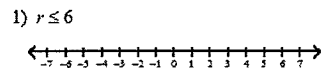
$<$ and $>$ use _____ like _____

\leq and \geq use _____ like _____

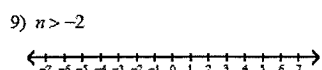
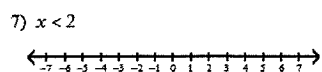
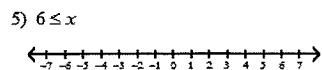
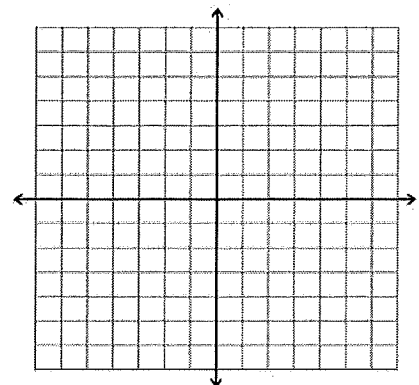
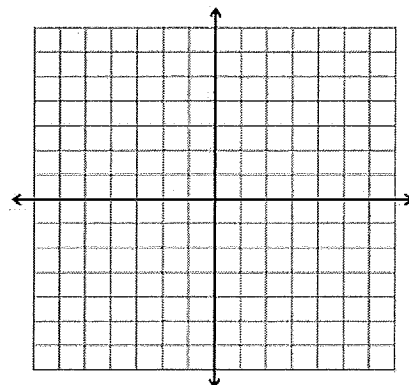
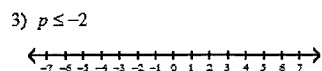
We read an inequality from the variable to the number

$n > 4$ Is read as _____

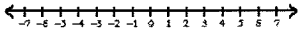
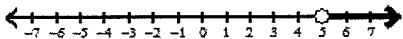
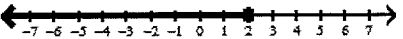
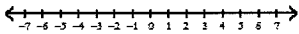
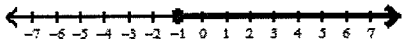
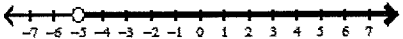
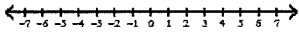
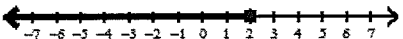
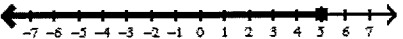
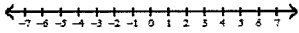

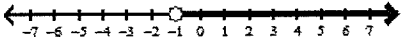
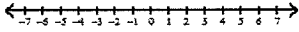
$-3 \geq n$ Rewrite to be: _____ so it is read as _____



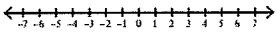
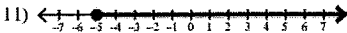
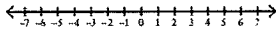
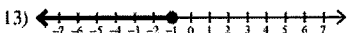
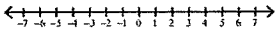
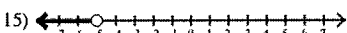
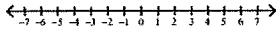
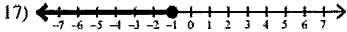
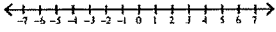
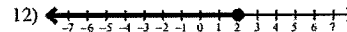
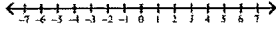
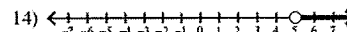
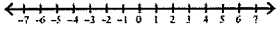
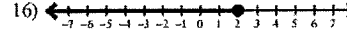
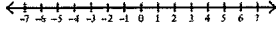
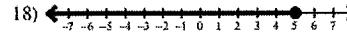
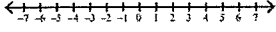
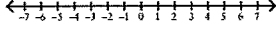
For #5 and #7, graph on a coordinate plane as well...



Write the inequality that goes with each graph:

2) $5 \leq n$ 	11) 	12) 
4) $2 > n$ 	13) 	14) 
6) $v \geq -5$ 	15) 	16) 
8) $v \geq -2$ 	17) 	18) 
10) $-2 \leq m$ 		

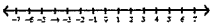
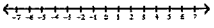
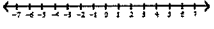
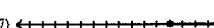
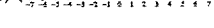

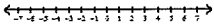
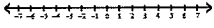
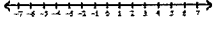
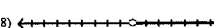
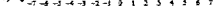

Practice Quizzes –
Work through these problems for understanding, not just completion. Ask if you need more practice. Check answers on the last page of your SSS.

Chapter 3 Concept 1 (part 1). Draw a graph for each inequality. For any problems with "x" as a variable, draw the solution on a number line AND on a coordinate plane.	Chapter 3 Concept 1 (part 2). Write an inequality for each graph.
1) $v \geq 2$ 	11) 
2) $x \geq 5$ 	13) 
3) $m \geq -5$ 	15) 
4) $2 < x$ 	17) 
5) $-2 < m$ 	12) 
6) $5 \leq x$ 	14) 
7) $-5 \leq b$ 	16) 
8) $x > 2$ 	18) 
9) $b \leq -2$ 	
10) $x > 5$ 	

#2 Checking if a number is a solution to an inequality

If a number "is a solution", that means that it will be _____ on the graph!

If a number "is a solution", that means that it will make a _____ in the equation!

<p>19) $a \geq 4$ </p> <p>21) $-3 < x$ </p> <p>23) $1 \leq n$ </p> <p>25) $x < 5$ </p> <p>27) $x \geq 2$ </p> <p>29) $x < 1$ </p>	<p>20) $x \geq 1$ </p> <p>22) $a < -6$ </p> <p>24) $4 \leq n$ </p> <p>26) $x < 5$ </p> <p>28) $x \geq 2$ </p> <p>30) $x < 1$ </p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>#19</th> <th>#20</th> <th>#21</th> <th>#22</th> <th>#23</th> <th>#24</th> <th>#25</th> <th>#26</th> <th>#27</th> <th>#28</th> <th>#29</th> <th>#30</th> </tr> <tr> <td>-5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	-5													-3													-1													0													1													2													3													4													5												
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Practice Quizzes –
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Chapter 3 Concept 2. Write which equations/graphs have the following numbers as solutions: (make a chart): -5, -3, -1, 0, 1, 2, 3, 4, 5

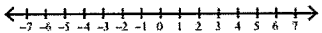
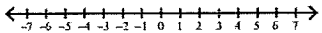
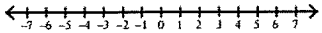
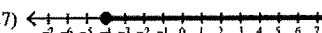


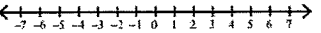
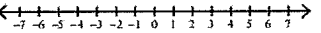
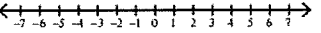
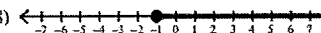

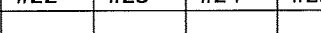
<p>19) $-1 > k$ </p> <p>21) $2 \geq k$ </p> <p>23) $5 \geq x$ </p> <p>25) $x < 2$ </p> <p>27) $x \geq -1$ </p> <p>29) $x < 1$ </p>	<p>20) $-5 > n$ </p> <p>22) $x \geq -5$ </p> <p>24) $m < -1$ </p> <p>26) $x < 5$ </p> <p>28) $x \geq -1$ </p> <p>30) $x < 1$ </p>
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Chart for PQ2 (can do on here). #19 is done for you as an example.

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30
-5	YES											
-3	YES											
-1	NO (open circle)											
0	NO											
1	NO											
2	NO											
3	NO											
4	NO											
5	NO											

Explanation: #19 should be re-written as $k < -1$. So, everything to the LEFT of -1 and not including it should be shaded!

#3	Solving inequalities with addition and subtraction/graph and check solutions		
<p>Solving an inequality is JUST LIKE _____ !!!</p> <p>Make sure to:</p> <ol style="list-style-type: none"> 1. Write your solution A _____ 2. Graph your solution on a N _____ L _____ or C _____ P _____ (both if the variable is x!) 3. Write your solution in a S _____ using your vocabulary. 			
<p><u>Solving equations (Hokey Pokey)</u> Get your variables here Put your constants there Do the opposite operation Just to keep things fair Subtract and Add First Till they're all on their own side Then it's time to divide!</p> <p>Before you get too crazy Draw your fence as a line Separating the equation By the equals sign Check for distribution And then you can combine Like terms on the same side!</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> 31) $n - 6 > -1$ 33) $-23 \leq m - 15$ 35) $24 < x + 7$ 37) $10 + x \geq 26$ </td> <td style="width: 50%; vertical-align: top;"> 32) $3 \leq 14 + r$ 34) $n - 19 \leq -15$ 36) $-9 \geq b - 1$ 38) $v - 19 > -31$ </td> </tr> </table>	31) $n - 6 > -1$ 33) $-23 \leq m - 15$ 35) $24 < x + 7$ 37) $10 + x \geq 26$	32) $3 \leq 14 + r$ 34) $n - 19 \leq -15$ 36) $-9 \geq b - 1$ 38) $v - 19 > -31$
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Practice Quizzes –
 Work through these problems for understanding, not just completion. Ask if you need more practice. Check answers on the last page of your SSS.

Chapter 3 Concept 3. Solve each inequality and graph its solution. (Number line for all, coordinate plane for any with the variable of "x"). Lastly, write your solution as a sentence.

31) $r - 4 > 8$

32) $m - 8 \geq -25$

33) $15 > 16 + x$

34) $-1 \leq n + 4$

35) $-33 \geq -16 + b$

36) $7 < v - 4$

37) $7 < x + 12$

38) $x - 8 \geq -10$

#4

Solving inequalities with multiplication and division/graph and check solutions

Solving inequalities (M-I-C-K-E-Y M-O-U-S-E)

Multiply

Or divide

By a negative

Means you flip (clap clap)

The inequality (clap clap)

You must flip the sign the other way around!

Whenever you _____ or _____

By a negative, The _____ must _____

Example:

$$-3x < 6 \rightarrow$$

$$\frac{-3x}{-3} < \frac{6}{-3} \rightarrow$$

$$x > -2$$

Non-Example:

$$2x < -8 \rightarrow$$

$$\frac{2x}{2} < \frac{-8}{2} \rightarrow$$

$$x < -4$$

Make sure to:

1. Write your solution A _____
2. Graph your solution on a N _____ L _____ or C _____ P _____ (both if the variable is x!)
3. Write your solution in a S _____ using your vocabulary.

39) $-44 \geq -11n$

40) $-11n < 33$

41) $14 > 7m$

42) $-3p > 57$

43) $20 \geq \frac{x}{15}$

44) $-6n < 6$

45) $-36 > 18a$

46) $\frac{p}{2} > -20$

Practice Quizzes –

Work through these problems for understanding, not just completion. Ask if you need more practice. Check answers on the last page of your SSS.

Chapter 3 Concept 4. Solve each inequality and graph its solution.

39) $-36 > -18a$

40) $200 > 20k$

41) $\frac{p}{9} \geq 18$

42) $-323 > 17n$

43) $-18 < \frac{x}{12}$

44) $-16r \geq -96$

45) $-4m \leq -40$

46) $-12 \geq \frac{x}{4}$

#5 Solving multi-step inequalities/ checking solutions. Inequalities include distribution, variables on both sides, etc

47) $74 \geq -10 - 6x$

48) $-2 \geq 8 + 5r$

49) $-2(5 + n) \geq -22$

50) $-2(-6 + b) < 22$

51) $1 \geq 8 - 8v + 1$

52) $4x - 2x \leq 6$

$$53) -15 \geq 1 + 8a + 8$$

$$54) -8n - 3n \geq 22$$

$$55) -6(1 + 5x) + 2x \geq -34$$

$$56) -8(1 + 6k) > -56$$

$$57) -5(x + 5) > -20$$

$$58) 36 > -5(5n + 4) + 6$$

$$59) -69 \leq 3(p + 8) + 6(4p + 7)$$

$$60) 8(k + 2) + 6(5 + 5k) > -30$$

$$61) -27 < 5(4n + 8) - 7(n + 4)$$

$$62) 32 > -8(8 + 4x) - 8(4 + 4x)$$

Practice Quizzes –

Work through these problems for understanding, not just completion. Ask if you need more practice. Check answers on the last page of your SSS.

Chapter 3 Concept 5. Solve each inequality and graph its solution.

47) $-9(-9 + n) < -81$

48) $4 < \frac{b}{6} + 3$

49) $-6 \geq 1 + 3x + 4x$

50) $-6 + 7v - 8 \leq 7$

51) $-8(6 + 5n) \geq 32$

52) $7(-6a + 6) < -42$

53) $54 > -2(k - 7) - 7(k - 7)$

54) $7(x + 6) - 8(1 + 6x) < -7$

#6 Solving absolute value equations

To solve an absolute value equation, you must first get rid of _____

Then, you will set up T _____ E _____

What is inside the absolute value symbols N _____ E _____ C _____

63) $|a| = 5$

64) $|k| = 1$

65) $|x + 7| = 2$

66) $|x + 7| = 9$

67) $|8m + 5| = 37$

68) $|-4n - 8| = 28$

$$69) 6|4x| = 24$$

$$70) |6p| + 9 = 15$$

$$71) 9 - 10\left|\frac{n}{5}\right| = 3$$

$$72) 2 + 3\left|\frac{b}{2}\right| = 8$$

$$73) -8|2r + 4| = -48$$

$$74) \frac{|6x + 3|}{3} = 3$$

$$75) 4|6 - 5a| - 7 = 49$$

$$76) -7 - 9|n + 3| = -43$$

Practice Quizzes -

Work through these problems for understanding, not just completion. Ask if you need more practice. Check answers on the last page of your SSS.

Chapter 3 Concept 6. Solve each equation.

$$55) |x| = 9$$

$$56) |n| = 2$$

$$57) |b + 9| = 14$$

$$58) |v + 3| = 12$$

$$59) |9 + 2x| = 9$$

$$60) |7x + 1| = 22$$

$$61) 1 + |2a| = 19$$

$$62) -7 + \left| \frac{k}{4} \right| = -6$$

$$63) 7 + 3 \left| \frac{x}{5} \right| = 10$$

$$64) 9 \left| \frac{p}{2} \right| - 2 = 25$$

$$65) \frac{|-7n - 10|}{8} = 1$$

$$66) -9|-3m - 5| = -36$$

$$67) 10|4x - 9| + 4 = 14$$

$$68) 2 - 6|r - 1| = -10$$

Chapter 3 Concept 1 (part 1). Draw a graph for each inequality. For any problems with "x" as a variable, draw the solution on a number line AND on a coordinate plane.

1) $x \geq 5$

Chapter 3 Concept 1 (part 2). Write an inequality for each graph.



Chapter 3 Concept 2. Write which equations/graphs have the following numbers as solutions: (make a chart): -5, -3, -1, 0, 1, 2, 3, 4, 5

4) $5 < n$

5) $2 < r$



Chapter 3 Concept 3. Solve each inequality and graph its solution. (Number line for all, coordinate plane for any with the variable of "x"). Lastly, write your solution as a sentence.

8) $x + 7 \leq -9$

Chapter 3 Concept 4. Solve each inequality and graph its solution. (Number line for all, coordinate plane for any with the variable of "x"). Lastly, write your solution as a sentence.

9) $-168 < -14n$

Chapter 3 Concept 5. Solve each inequality and graph its solution. (Number line for all, coordinate plane for any with the variable of "x"). Lastly, write your solution as a sentence.

10) $1 > \frac{k}{5} - 2$

11) $2 > 8 - 2p + 8$

12) $-8x - 2x < 0$

13) $40 > 8(5 - 7n)$

14) $5(1 + 8m) + 3(m - 3) > 39$

Chapter 3 Concept 6. Solve each equation.

15) $|r| = 5$

16) $|x + 10| = 19$

17) $|7n - 1| = 55$

18) $|-10b| - 3 = 97$

19) $10|4v| - 5 = 35$

20) $|10x - 1| - 1 = 70$

21) $|2n - 2| - 5 = 9$

Chapter 1 Concept 8 Review. Evaluate each using the values given.

22) $c = (a - c \div 5)$; use $a = 4$, and $c = 5$

Chapter 2b Concept 4 Review

23) Find two consecutive integers whose sum is 151.