Name ____________________

Date______ Pd ____

Summer Reading Assignment for Algebra II

Before the first day of Algebra II class, students must complete all problems enclosed in this packet. This is a review of what you previously learned in Algebra I. If you have trouble, try getting help from the internet at www.purplemath.com or from a peer or mentor.

The Algebra II course traditionally serves as the foundation course for all advanced studies in mathematics. Pre-requisites for this course are Algebra I and Geometry. This is a required course for the College Completer, and helps to prepare the student for the SAT. Successful completion of Algebra II provides a gateway for college level mathematics.

The Algebra II Math teachers at Arundel High School look forwarding to working with you in class. Completing this packet will prepare you for the first day of class. This will count as your first Homework Assignment. As with all HW, you must show work for credit.

NAME ______ DATE ______ SECTION ______ **3-15**

Solving Equations with Variables on Both Sides

Sometimes equations are written with variables on both sides of the equal symbol. In order to solve these types of equations, you must rewrite the equations so that the variables are on the same side of the equation.

Directions: Solve each equation below. Write the letter of the problem above its solution to complete the statement at the end of the activity.

P. $7x = x - 54$

R. $4x - 9 = 3 - 4x$

L. $x - 10 = -2x + 2$

O. $-1 + x = 7x + 2$

B. $3x - 7 = x + 11$

W. $4x - 9 = 3 + 4x$

N. $3(x - 7) = 2x$

K. $9x = 3(x - 2)$

U. $-8x - x = 24 - x$

H. $-8 + 5x = 3x - 11 + 5x$

A. $-13 + x = 4x + 23 + 6x$

F. $3(2x - 1) + x = x - 3$

V. $4(3x - 5) - x = -x + 16$

T. $2(1 - x) = 3(x + 9)$

E. $2(3 - 4x) = 4 + 4(6 - x)$

S. $9(2x + 3) = -36 - 27(x + 2)$

In 1637, René Descartes used the first letters of the

___	___	___	___	___	___	___	___		___	___	___
–4	4	–9	1	–4	9	–5.5	–5		0	–0.5	1.5

___	___	___	___	___		___	___	___	___	___	___
–1	21	–0.5	ø	21		3	–4	4	–3	–5.5	–2.6

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NAME ______________________ DATE ________ SECTION ________ **3-18**

Solving Multi-step Inequalities

The rules that apply to solving equations apply to solving inequalities as well. Follow these steps:

1. Simplify each side of the inequality.
2. Add or subtract.
3. Multiply or divide by any nonzero number.

If you multiply or divide both sides of the inequality by a negative number, you must change the direction of the inequality sign.

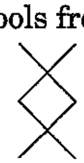
Directions: Solve each inequality. Find the solution in the Answer Bank and write the letter of the solution in the blank before the problem number. Then write the letters in order, starting with the first problem, in the blanks to complete the statement at the end of the activity. Some letters will be used more than once.

1. _____ $5x - 7x > 40$
2. _____ $6x - 5 > 11 - 2x$
3. _____ $-5x + 6 < 16$
4. _____ $5x - 4 - 6x \geq -10$
5. _____ $7 - 2x \geq 19$
6. _____ $\frac{-x}{3} + 5 < -2$
7. _____ $8x - 7x \geq 0$
8. _____ $2(4 - x) - 2 \leq -2x + 6$
9. _____ $3 - \frac{2}{5}x > 5$
10. _____ $4x + 6 \leq 2x - 6$
11. _____ $3x - 2(x - 4) > 7$
12. _____ $4(3x - 1) \geq 2(x + 3)$
13. _____ $2(x - 6) > 2x - 2$
14. _____ $3(5 - x) - 7 \geq -3x + 8$
15. _____ $7x - (9x + 1) > -5$

Answer Bank

H.	$x \geq 0$
E.	all real numbers
Y.	$x > 2$
C.	$\emptyset$
B.	$x \leq 6$
L.	$x > 21$
I.	$x \geq 1$
S.	$x < -20$
O.	$x \leq -6$
M.	$x > -2$
D.	$x < 2$
N.	$x < -5$
T.	$x > -1$

Thomas Harriot (1560–1621) first used the ">" and "<" symbols in a work published posthumously in 1631. It is believed he developed these symbols from a marking he saw on an arm of a Native American. This was the



___ ___ ___ ___ ___ ___   ___ ___

___ ___ ___ ___ ___ ___ ___:

NAME DATE SECTION

4-4

Finding the Slope and Y-intercept from a Graph

The graph of a linear equation consists of all of the points that are solutions to the equation. By examining the graph, you can determine the slope of the line and the y-intercept.

The *slope* of a line is the ratio of the change in y to the change in x. The slope is always constant. It can be found by choosing any two points on a line.

The y-*intercept* is the point where the line crosses the y-axis. It is located at only one point.

Directions: Find each line on the grid on the next page. Starting with l_1, find the letter in the Answer Bank that corresponds to the slope of l_1 and write the letter in the first space in the blanks below. Then find the letter in the Answer Bank that corresponds to the y-intercept of l_1 and write that in the blank next to the slope of l_1. Follow the same procedure with the other seven lines. (For each line, the letter that corresponds to the slope should be written in the first blank, and the letter that corresponds to the y-intercept should be written in the second blank.) Break the letters into words to reveal a statement. The first one is done for you.

Answer Bank

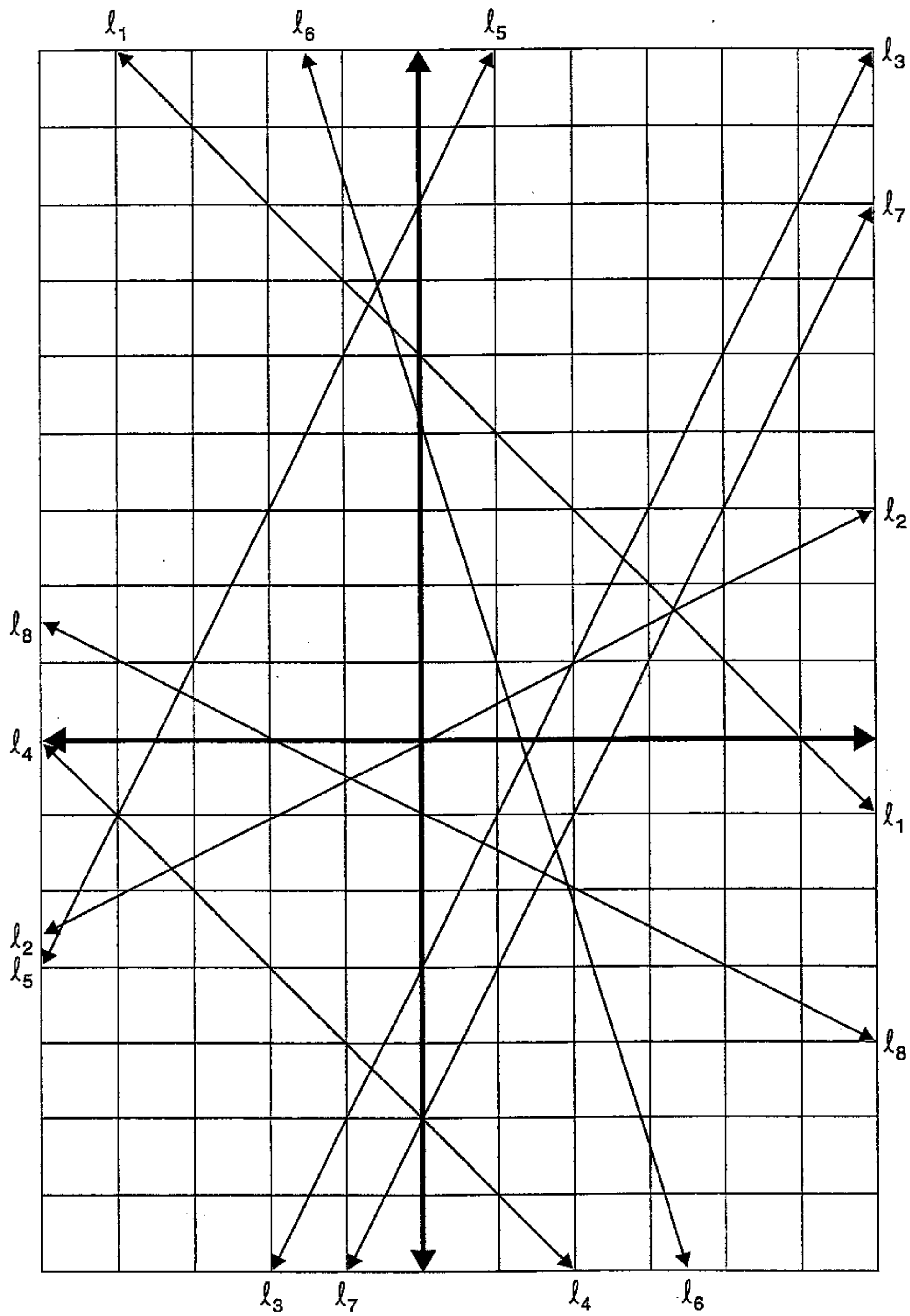
N. 4	S. –1	E. 2	A. $-\frac{1}{2}$	F. 7
O. $\frac{1}{2}$	I. –3	L. 5	D. –5	P. 0

S L (l_1) __ __ (l_2) __ __ (l_3) __ __ (l_4) __ __ (l_5) __ __ (l_6) __ __ (l_7) __ __ (l_8) rise over run.

NAME DATE SECTION

4-4 (continued)

Finding the Slope and Y-intercept from a Graph



NAME ____________ DATE ________ SECTION ________

4-5

Using the Slope and Y-intercept to Graph a Line

The slope and y-intercept enable you to draw the graph of a linear equation. If the graph is drawn correctly, it contains all of the points that are solutions to the equation.

Directions: Use a ruler to graph the equation of each line described below. The graph is given on the next page. If you are accurate, each line should pass through two labeled points. Write the letters of these points on the lines before each problem. Hint: Some letters might need to be reversed.

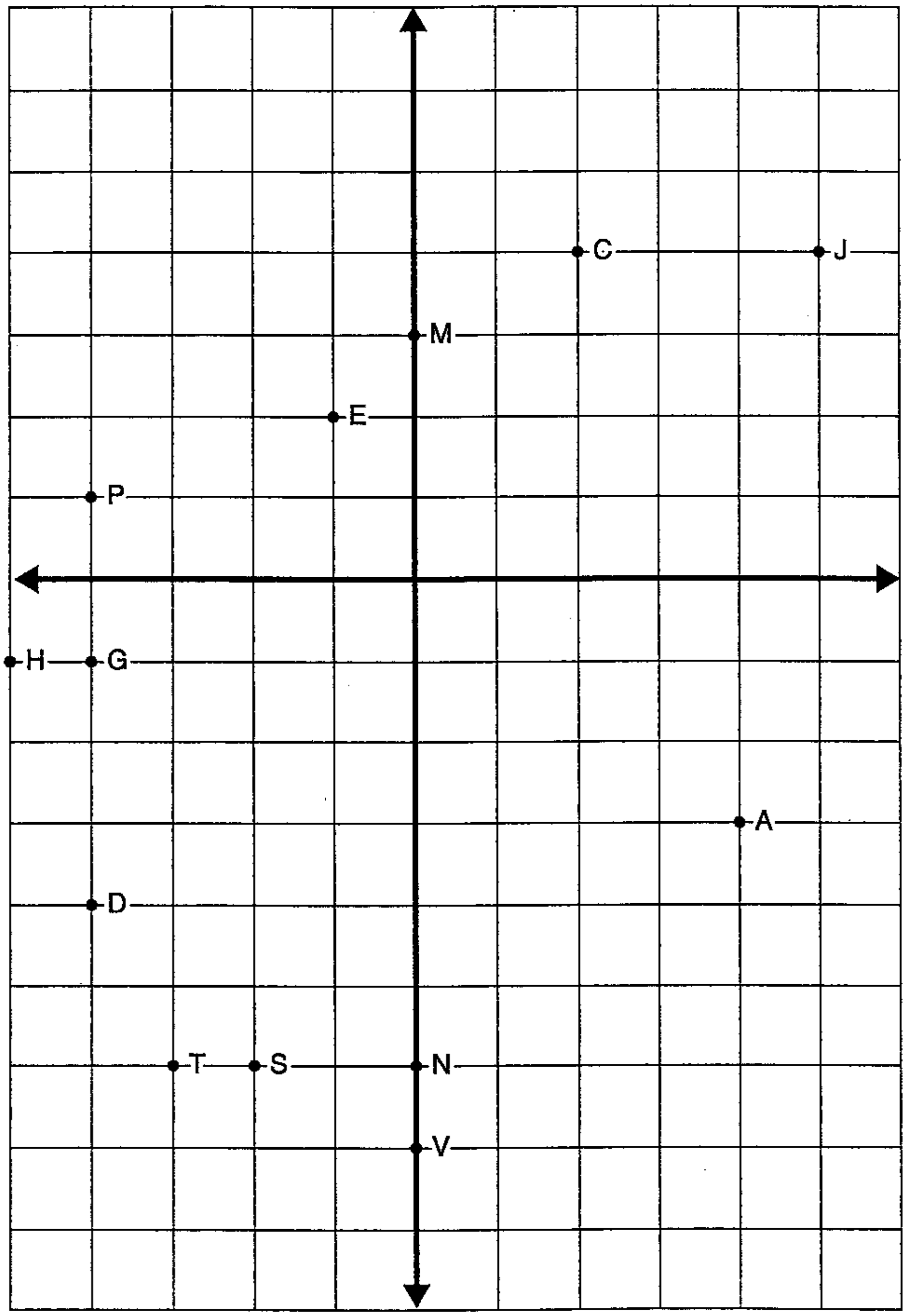
1. ________ $m = 2, b = 4$
2. ________ $m = -\frac{1}{2}, b = -1$
3. ________ $m = 2, b = -6$
4. ________ $m = -\frac{1}{4}, b = -2$
5. ________ $m = 2, b = 0$
6. ________ $m = -\frac{3}{2}, b = 3$
7. ________ $m = \frac{7}{4}, b = 3$
8. ________ $m = \frac{5}{2}, b = -1$
9. ________ $m = -1, b = -6$
10. ________ $m = 1, b = -7$

What do these letters represent? ______________________________

____

____

Using the Slope and Y-intercept to Graph a Line



NAME DATE SECTION

4-6

Finding the Slope of a Line

* Do only odds on this page.

If you know two points on a line, or the equation of a line, you can find the slope of a line.

To find the slope of a line, do one of the following:

- If you are given two points, use the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ where m stands for the slope and (x_1,y_1) and (x_2,y_2) are two points on the line.
- If you are given an equation in slope-intercept form, use the formula $y = mx + b$ where m stands for the slope.
- If you are given an equation in standard form, use the formula $Ax + By = C$. Write the formula in slope-intercept form. The slope is $\frac{-A}{B}$.

Directions: Each line is described by two points or an equation. Find the slope, then locate the slope in the Answer Bank. Write the letter of each answer in the blank before its problem. Then write the letters in order, starting with the first one, to complete the statement at the end of the activity. Some letters are used more than once; others are not used at all.

1. _____ (0,2) and (5,2)
2. _____ (–3,1) and (2,–2)
3. _____ $y = 3x + 4$
4. _____ (6,–3) and (1,2)
5. _____ (–1,0) and (–4,1)
6. _____ $2x + y = -1$
7. _____ $y = 6x - 1$
8. _____ (–3,8) and (–3,4)
9. _____ $y = -x - 7$
10. _____ (0,1) and (1,7)
11. _____ (1,–2) and (–2,4)
12. _____ $x - 4y = 7$
13. _____ $3x - y = 10$
14. _____ (–3,–4) and (2,–4)
15. _____ $-3x + 2y = 6$
16. _____ $18x - 3y = -20$

Answer Bank

O.	0
R.	–2
N.	$\frac{3}{2}$
Y.	2
D.	ø
T.	$-\frac{1}{3}$
G.	3
H.	–1
I.	$\frac{1}{4}$
U.	$-\frac{3}{5}$
A.	–3
E.	6

William __ __ __ __ __ __ __ __ first used the symbol for parallel and Pierre __ __ __ __ __ __ __ __ first used the symbol for perpendicular.

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4-7

Finding the X- and Y-intercepts

Since two points determine a line, using the x-intercept and the y-intercept is one way to graph the equation of a line. The point where a graph intersects the x axis is (x,0). x is called the x-intercept of the graph. The point where a graph intersects the y axis is (0,y). y is called the y-intercept of the graph.

To find the x-intercept, substitute 0 for y and solve for x.
To find the y-intercept, substitute 0 for x and solve for y.

Directions: Find the x- and y-intercepts of the graph of each equation. Write your answer in the space provided after the intercepts. Then find the letter of your answer in the Answer Bank and write the letter in the blank before the intercepts. Finally, write the letters in order, starting with the first one, in the blanks to complete the statement at the end of the activity on the next page. Some letters will be used more than once; others will not be used at all.

1. $y = 2x + 4$

_____ x-intercept = _____

_____ y-intercept = _____

2. $y = 3x + 1$

_____ x-intercept = _____

_____ y-intercept = _____

3. $-3x + y = 6$

_____ x-intercept = _____

_____ y-intercept = _____

4. $y = \frac{1}{4}x - 6$

_____ x-intercept = _____

_____ y-intercept = _____

5. $y = 5x - 5$

_____ x-intercept = _____

_____ y-intercept = _____

Answer Bank

F. 0
S. −2
V. $\frac{1}{3}$
E. 1
X. 10
Y. 15
O. 24
U. 7
M. $-\frac{1}{3}$
B. −5
L. 6
I. 12
T. ø
D. −36
R. $-\frac{1}{2}$
A. 4
C. 2
P. −6
N. −3

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4-7 (continued)

Finding the X- and Y-intercepts

6. $x = 7$

_____ x-intercept = _____

_____ y-intercept = _____

7. $y = \frac{1}{3}x + 12$

_____ x-intercept = _____

_____ y-intercept = _____

8. $y = 3x$

_____ x-intercept = _____

_____ y-intercept = _____

9. $2y = x - 1$

_____ x-intercept = _____

_____ y-intercept = _____

10. $x = \frac{1}{3}y + 1$

_____ x-intercept = _____

_____ y-intercept = _____

11. $y = 15$

_____ x-intercept = _____

_____ y-intercept = _____

Parallel lines have the ___ ___ ___ ___   ___ ___ ___ ___ ___   ___ ___ ___

___ ___ ___ ___ ___ ___ ___ ___ ___   ___-intercepts.