Mason County Schools

Point Pleasant High School

Snow and Go Packet

Algebra II

Days 1-5

Enclosed in this packet are the Snow and Go instructions and worksheets for five potential days of Non-Traditional Instruction in Algebra 2. In essence, you will be expected to work through these lessons, one per day, if school is called off because of inclement weather. You are to work on these in the order they are listed: Day 1 will be for the first day off, Day 2 for the second, etc.

The first three days only have one worksheet, with basic instructions. Days 4 & 5 have a set of instructions which include examples, plus a worksheet with problems or activities for you to complete. The instruction sheets for these last two days are to help you, and are not to be turned in. The worksheets/activities are for you to turn in your first day back in school. These WILL be graded and will count toward your final grade in the grading period.

Please be sure to follow all directions. You teacher can be reached via a message on Live Grades during regular school hours on the day you are off if you have any questions while doing the work.

Snow and Go Packet - Day 1 - Properties of Real Numbers

Algebra II

Name ____________________ Period ______________ Grade Earned: ____________

Please complete the following problems. If you need more space, you may show your work on a separate sheet of paper. Please make sure to staple this sheet to the top of your paper. Remember this assignment is due when you return to school, and it WILL count as a grade.

Simplify Each Expression:

1. $8(3a - b) + 4(2b - a)$
2. $40s + 18t - 5t + 11s$
3. $\frac{1}{5}(4j + 2k - 6j + 3k)$
4. $10(6g + 3h) + 4(5g - h)$
5. $12\ (a/3 - b/4)$
6. $8(2.4r - 3.1s) - 6(1.5r + 2.4s)$
7. $4(20 - 4p) - \frac{3}{4}(4\text{-}16p)$
8. $5.5j + 8.9k - 4.7k - 10.9j$
9. $1.2(7x - 5) - (10 - 4.3x)$
10. $9(7e - 4f) - 0.6(e + 5f)$
11. $2.5m(12 - 8.5)$
12. $\frac{3}{4}p - \frac{1}{5}r - \frac{3}{5}r - \frac{1}{2}p$
13. $4(10g - 80h) - 20(10h - 5g)$
14. $2(15 + 45c) + \frac{5}{6}(12 + 18c)$
15. $(7 - 2.1x)3 + 2(3.5x - 6)$
16. $\frac{2}{3}(18 - 6n + 12 + 3n)$
17. $14(j - 2) - 3j(4 - 7)$
18. $50(3a - b) - 20(b - 2a)$

Snow and Go Packet - Day 2 – Identify Sets of Numbers, Name Properties, and Simplify Expressions

Algebra II

Name ____________________________ Period __________ Grade Earned: ______

Please complete the following problems. If you need more space, you may show your work on a separate sheet of paper. Please make sure to staple this sheet to the top of your paper. Remember this assignment is due when you return to school, and it WILL count as a grade.

Name the sets of numbers to which each number belongs:

1. 6435
2. $\sqrt{7}$
3. $2\prod$
4. 0
5. $\sqrt{\frac{25}{36}}$
6. $-\sqrt{16}$
7. -35
8. -31.8

Name the property illustrated by each equation:

9. $5x \cdot (4y + 3x) = 5x \cdot (3x + 4y)$
10. $7x + (9x + 8) = (7x + 9x) + 8$
11. $5(3x + y) = 5(3x + 1y)$
12. $7n + 2n = (7 + 2)n$
13. $3(2x)y = (3 \cdot 2)(xy)$
14. $3x \cdot 2y = 3 \cdot 2 \cdot x \cdot y$
15. $(6 + -6)y = 0y$
16. $\frac{1}{4} \cdot 4y = 1y$
17. $5(x + y) = 5x + 5y$
18. $4n + 0 = 4n$

Name the additive inverse and the multiplicative inverse for each number:

19. 0.4
20. -1.6
21. $-\frac{11}{16}$
22. $5\frac{5}{6}$

Simplify each expression:

23. $5x + 3y - 2x + 3y$

24. $-11a - 13b + 7a - 3b$

25. $8x - 7y - (3 - 6y)$

26. $4c - 2c - (4c + 2c)$

27. $3(r - 10s) - 4(7s + 2r)$

28. $\frac{1}{5}(10a - 15) + \frac{1}{2}(8 + 4a)$

29. $2(4 - 2x + y) - 4(5 + x - y)$

30. $\frac{5}{6}(\frac{3}{5}x + 12y) - \frac{1}{4}(2x - 12y)$

31. **Travel.** Olivia drives her car at 6o miles per hour for t hours. I drives his car at 50 miles per hour for (t + 2) hours. Write a simplified expression for the sum of the distances traveled by the two cars.

For your reference:

Property	Definition	Addition	Multiplication
Commutative	Changing the order of the number will not change the result.	a + b = b + a Ex: 2 + 3 = 3 + 2 = 5	a * b = b * a Ex: 2 * 3 = 3 * 2 = 6
Associative	Changing the grouping of the numbers will not change the result.	a + (b + c) = (a + b) + c Ex: 1 + (2 + 3) = (1 + 2) + 3 = 6	a * (b * c) = (a * b) * c Ex: 1 * (2 * 3) = (1 * 2) * 3 = 6
Identity	**Zero** and **one** preserves identities under addition or multiplication respectively	a + 0 = 0 + a = a Ex: 2 + 0 = 0 + 2 = 2	1 * a = a * 1 = a Ex: 1 * 2 = 2 * 1 = 2
Inverse	For each real number a, there exist a unique number - a and 1/a for additive or multiplicative inverse.	a + (- a) = 0 Ex: 2 + (- 2) = 0	a * 1/a = 1 Ex: 2 * ½ = 1
Distributive	Multiplication distributes over addition. a(b + c) = ab + ac	—	—

Snow and Go Packet - Day 3 – Solve Equations Including Literal Equations

Algebra II

Name ______________________ Period ____________________ Grade Earned: ____________

Please complete the following problems. If you need more space, you may show your work on a separate sheet of paper. Please make sure to staple this sheet to the top of your paper. Remember this assignment is due when you return to school, and it WILL count as a grade.

Solve each equation – Check your solution.

1. $3s = 45$
2. $17 = 9 - a$
3. $5t - 1 = 6t - 5$
4. $\frac{2}{3}m = \frac{1}{2}$
5. $7 - \frac{1}{2}x = 3$
6. $-8 = -2(z + 7)$
7. $0.2b = 10$
8. $3x + 17 = 5x - 13$
9. $5(4 - k) = -10k$
10. $120 - \frac{3}{4}y = 60$
11. $\frac{5}{2}n = 98 - n$
12. $4.5 + 2p = 8.7$
13. $4n + 20 = 53 - 2n$
14. $100 = 20 - 5r$
15. $2x + 75 = 102 - x$

Solve each equation or formula for the specified variable:

16. $a = 3b - c$, for b
17. $\frac{s}{2t} = 10$, for t
18. $h = 12g - 1$, for g
19. $\frac{3pq}{r} = 12$, for p
20. $2xy = x + 7$, for x
21. $\frac{d}{2} + \frac{f}{4} = 6$, for f
22. $3(2j - k) = 108$, for j
23. $3.5s - 42 = 14t$, for s
24. $\frac{m}{n} + 5m = 20$, for m
25. $4x - 3y = 10$, for y

Snow and Go Packet – Day 4 – Algebra 2

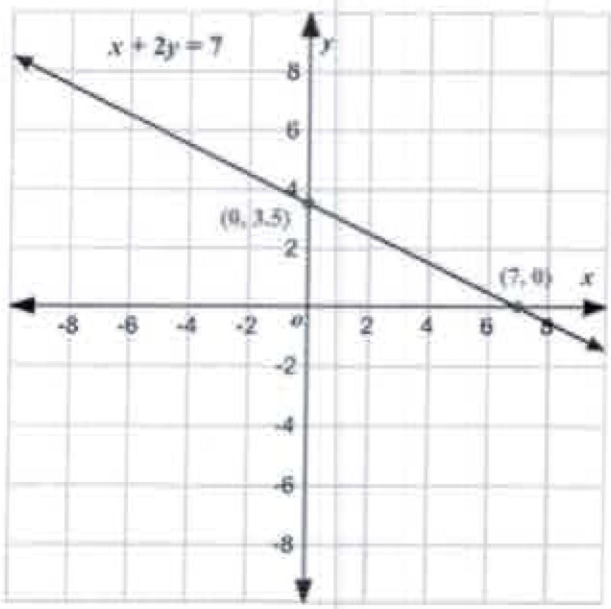
Today we will be reviewing the graphing of linear equations, and along the way we will emphasize how to transform a linear equation from standard form to slope-intercept form and vice versa. You will remember that a linear equation consists of variables with no exponent other than 1. The graph of a linear equation is a straight line. To graph a straight line, you will need to know two points, and then draw a straight line that includes those points.

Part 1 – Graphing by plotting points.

You will recall that the standard form of a linear equation is:

$Ax + By = C$, where A, B, and C are integers.

Let us take an example: $x + 2y = 7$. (In this equation, the coefficient of x is simply 1). We can graph this equation by plotting points. For example, if $x = 0$, then the equation can be written as $0 + 2y = 7$. Dividing both sides by 2, we discover $y = 7/2$. We can then plot this point at (0, 7/2). If y is zero, then we can substitute 0 for y and we have this equation: $x + 2(0) = 7$. When we solve this, $x = 7$, so we have a second point: (7,0), that we can plot on our graph. When we plot these and draw a line including these points, our graph will look like this:



The first four problems on your worksheet ask you to plot points to graph, so you might wish to do these now before you continue.

Part 2 – Graphing by using point-slope form.

A second way we might graph a linear equation is by converting the equation to slope-intercept form, and using that form to more quickly put the line of the equation on the graph. You will recall that slope-intercept form looks like this:

y = mx + b, where m is the slope and b is the y-intercept.

So how do we get to slope-intercept form? We simply manipulate the equation algebraicly until we have y by itself on one side. Take our sample equation: $x + 2y = 7$. To get y by itself, we first subtract x from both sides, leaving us with $2y = -x + 7$. We then divide both sides by 2, leaving us an equation that looks like this: $y = (-1/2)x + 7/2$. We are now in slope-intercept form. We now know that the slope of the line is -1/2 and the y-intercept is 7/2, so we can plot the graph.

We plot our first point at the y-intercept, (0,7/2). We can then use the slope to determine another point remembering that slop is rise over run. Thus, if the slop is -1/2, we would go up 1 and to the left 2 to plot our next point, which would be at (-2, 9/2).

Note that a negative slope means the line will slope downward from left to right, while a positive slope slopes upward from left to right. So when we plot a positive slop, we will go up and to the right; and when we plot a negative slope, we go up and to the left. In other words, a negative slope requires we go in a negative direction (left) while a positive slope requires we go in a positive direction (right).

Now that we have the second point, (-2, 9/2), we can draw our line through these two points and, presto, we have our graph.

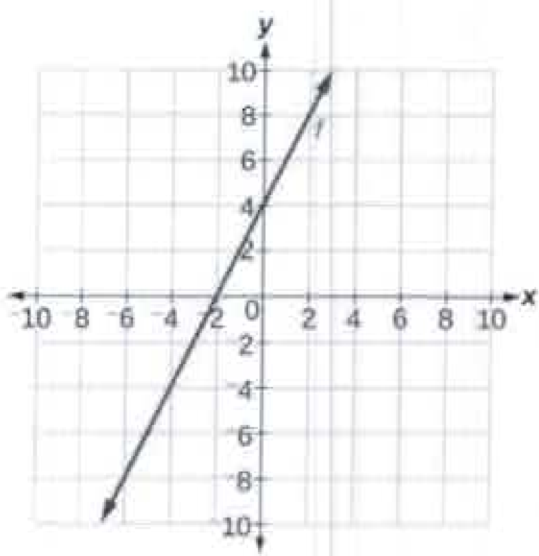
Your worksheet has several problems asking you to convert an equation to slope-intercept form and then graph the equation. You may wish to do these now.

Part 3 – Writing Linear Equations Given the Graph

When you think about it, if you are given a graph, you should have no trouble writing the equation of a line. Remember that slope-intercept form is:

y = mx + b, where m is the slope and b is the y-intercept.

If you were given the following graph, you could write the equation by identifying the y-intercept (where the line crosses the y-axis) and figuring the slope:



Where does this line cross the y-axis? If you said 4, you are absolutely correct. So if you were writing the equation, you would already have most of the information you need. Here is what you know so far: $y = mx + 4$. You can insert the 4 because you know that is the y-intercept. So now all you need to do is figure the slope.

To figure the slop, you simply want the rise over the run, so if you begin where the line crosses the x-axis, at the point (-2,0), and count up the number of spaces and over the number of spaces until it reaches (0,4), you would have the slope. Did you count up 4 and over 2 to the right? Are they both in a positive direction? Yes, they are, so you have a slope of 4/2, which can be reduced to 2/1 or just 2. (Note that each block is a distance of 2, not one, so you did, indeed, go up 4 and to the right 2) You can now substitute this for m in the equation, and you now have a linear equation for the line on the graph. It looks like this:

$$y = 2x + 4.$$

Just a note before you move on: If when figuring slope you had, say, gone up and then to the left, the movement to the left would have been in a negative direction, and you would have had a negative slope.

The final questions on your worksheet ask you to write a linear equation from the graph. You should complete those now.

Our hope is that this has been helpful to you in reviewing graphing linear equations. You may keep this example/instruction sheet. You will bring the worksheet with problems solved back to school the first day back.

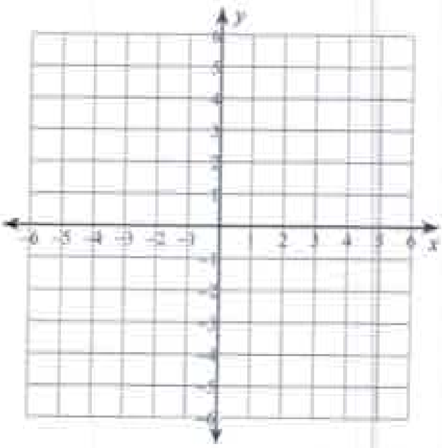
Algebra 2 Name________________________________ ID: 1

Snow and Go Day 4 Worksheet

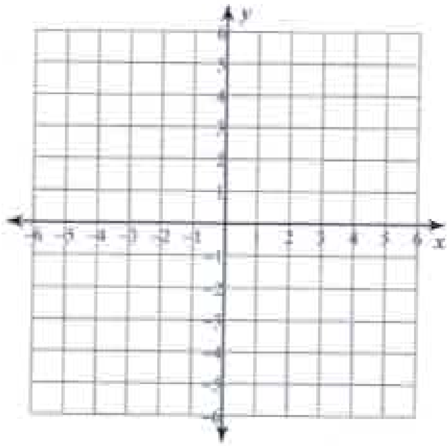
Date________________ Period____

Sketch the graph of each line by plotting points.

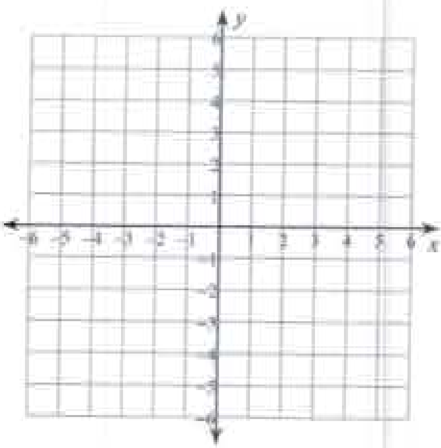
1) $2x - y = 0$



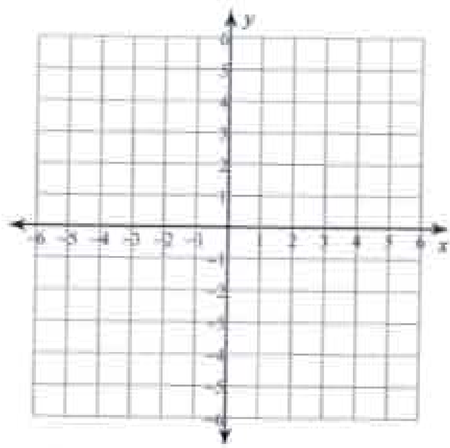
2) $x + 3y = 9$



3) $x + y = -4$

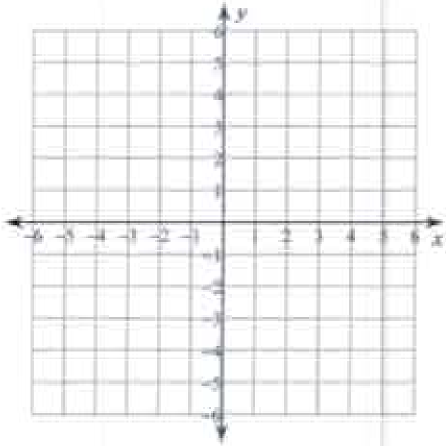


4) $x + 4y = 0$

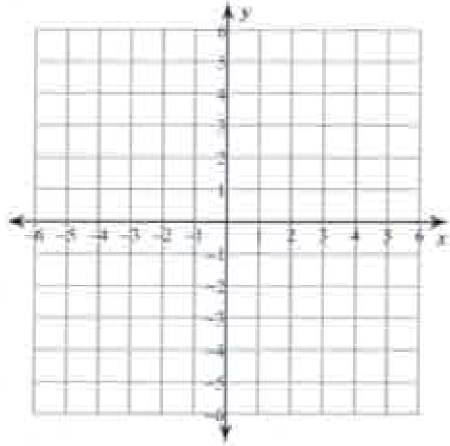


Convert each equation to slope-intercept form and then sketch the graph of each line. (Show your work converting to slope-intercept, please)

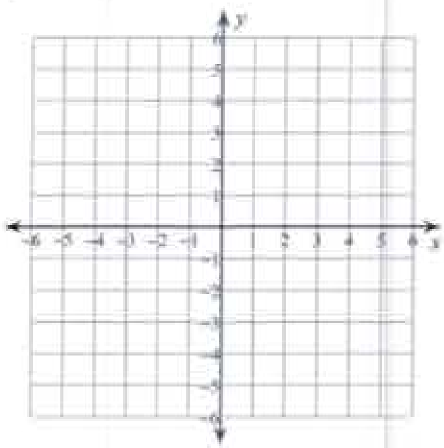
5) $x + 4y = -16$



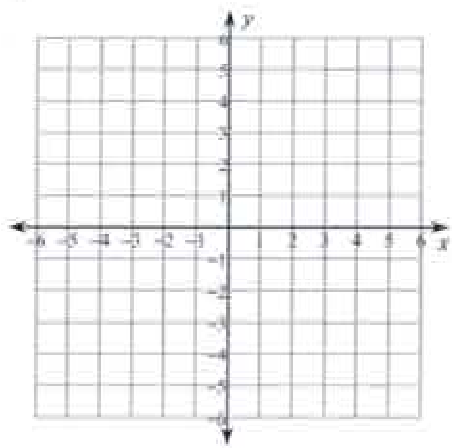
6) $7x - 5y = -10$



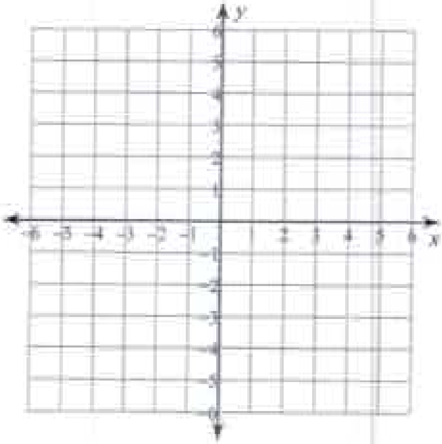
7) $5x + y = -5$



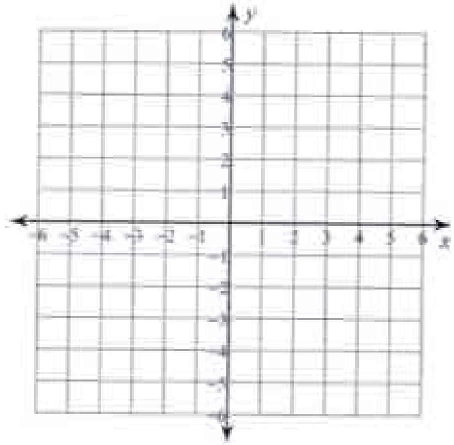
8) $x = -3$



9) $3x + 2y = -6$

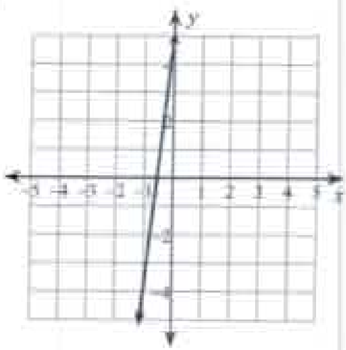


10) $2x - 3y = -9$

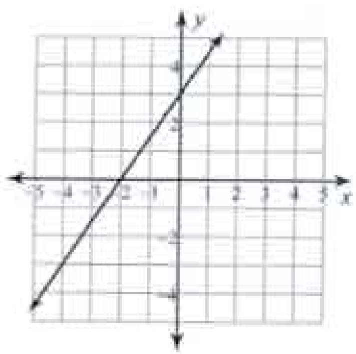


Write the slope-intercept form of the equation of each line.

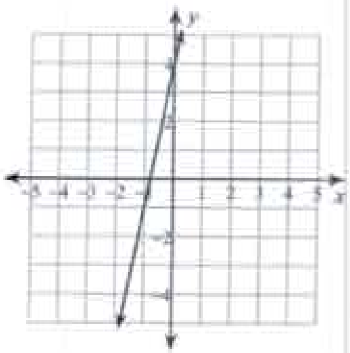
11)



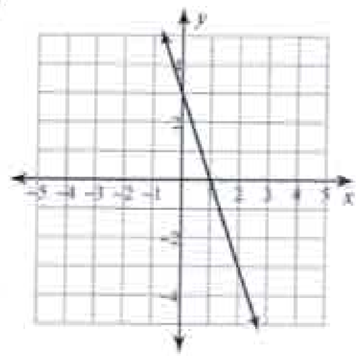
12)



13)



14)



Algebra 2 – Snow and Go Day Packet – Day 5

Today we will be reviewing how to solve systems of equations. A system of equations is two or more equations with the same variables that are solved together. For example:

$$2x - 3y = -2$$

$$4x + y = 4$$

You will remember there are three methods we have learned thus far for solving systems of equations:

1) Graphing
2) Substitution
3) Elimination

Let's begin with graphing:

Part 1: Graphing

When you graph a system of equations, you will recall that the goal is to graph each line separately, and then look for where the lines cross to find the solution. There are two ways you can graph the equations:

1) Plotting points
2) Putting each equation into slope-intercept form and graphing using the y-intercept and slope. If you have forgotten how to do this, refer back to Day 1 instructions.

So, let's try graphing the system of equations above. We need to have at least two points to graph a linear equation (remember: a linear equation's graph is a straight line). Let's try plotting points first. Consider the first equation: $2x - 3y = -2$. If x is 0, what is y? Think it through before reading on. Did you come up with 2/3? If so, well done! If not, let's work through it. If $x = 0$, then the term $2x = 0$ and we are left with: $-3y = -2$. To find y, we need y by itself on one side of the equation, so we will divide both sides by -3. That leaves us with $y = 2/3$. Hmmm. This one is not going to be particularly easy to graph, is it? But let's persevere.

If $y = 0$, what is x? Did you come up with -1? Remember, if $y = 0$, then the term $-3y = 0$, leaving the expression: $2x = -2$. When you divide both sides by 2 to leave x on one side by itself, you are left with $x = -1$. So, our two points for graphing are (0,2/3) and (-1,0). See the graph on the next page for how this looks.

Now, let's work through the second equation, $4x + y = 4$. If $x = 0$, what is y? If you answered 4, then you are correct! Remember, if $x = 0$ then $4x = 0$, leaving the equation $y = 4$. Now, what happens if $y = 0$? Did you end up with $x = 1$? If y is 0, then you are left with $4x = 4$. To leave x by itself, you divide both sides by 4, leaving us with x = 1. So, our points for drawing this line are: (0,4) and (1,0). See the graph on the next page for how this looks.

So, did the lines cross? At what point did they cross? So what is the solution to the system of equations?

(Answer: yes, they crossed, at a point somewhere near (2/3, 1) – it is impossible from the graph to pinpoint the exact location where the two lines cross, so we can only obtain an approximate solution by graphing – which is the limitation of using graphing as a solution method).

There are four practice problems on the attached worksheet that ask you to solve by graphing. You might wish to solve those now while this is fresh in your mind. Remember: the lines may cross at one point, or they may be parallel and not cross at all, or the two equations may graph to be the same line. If the lines cross at just one point, the system of equations is said to be consistent and independent, and the solution is one specific set of coordinates. If the lines are the same, they system is said to be consistent and dependent, in which case there are infinitely many solutions. If the lines are parallel and do not cross, the system is said to be inconsistent, and there are no solutions.

Part 2: Substitution

We will use the same system of equations to demonstrate how we solve by substitution. That is:

$$2x - 3y = -2$$

$$4x + y = 4$$

To solve by substitution, we must first solve one equation in terms of one variable, and substitute this answer back into the other equation for that variable. For example, let us solve the second equation, $4x + y = 4$, in terms of y. That means we need to algebraically manipulate the equation to isolate y on one side. To do this, we need to subtract 4x from both sides. This would look like:

$$4x - 4x + y = 4 - 4x.$$

Combining like terms, we are left with: $y = 4 - 4x$.

Since we now know that $y = 4\text{-}4x$, we can substitute "4-4x" for y in the first equation. That would look like this:

$$2x - 3(4\text{-}4x) = -2$$

Now we simply multiply this out and then solve for x. Distributing the -3, we have an equation that looks like this: $2x - 12 + 12x = -2$. Combining like terms gives us: $14x - 12 = -2$. Adding 12 to both sides gives us: $14x = 10$. Dividing both sides by 14 we have $x = 10/14$ or, when reduced, $x = 5/7$.

Well, we knew from graphing that the x-value of the solution was somewhere around 2/3, so 5/7 is in that vicinity, and is a much more accurate value.

But wait, we still have to find the y-value for the solution. To do this, we take our x-value, in this case 5/7, and substitute it for x into one of the equations, and then solve for y. Let's substitute it into the second equation: $4(5/7) + y = 4$. Multiplying that out, we have $20/7 + y = 4$. Subtracting 20/7 from both sides yields this equation: $y = 4 - 20/7$. Since $4 = 28/7$, we now have $y = 28/7 - 20/7$ or $y = 8/7$.

Remember, we estimated by graphing that the y-value for this problem was 1, and 8/7 is just slightly more than 1, and we now have a much more accurate solution to the system of equations than the one we obtained by graphing: (5/7, 8/7).

Your attached worksheet contains a series of problems to solve by substitution. You may wish to solve these now while this example is fresh in your mind.

Part 3 – Elimination

Once again, we will use the same sample equations to demonstrate how we solve by elimination.

The method of elimination involves adding or subtracting one equation from the other to eliminate one of the variables so we can solve for the other. To do this, we often must multiply one or both equations so that the coefficients of one variable are the same or opposites in both equations. Take another look at our sample equations:

$$2x - 3y = -2$$

$$4x + y = 4$$

None of the coefficients of the variables are the same or opposite, so we must multiply one or both equations to make this happen. We could multiply the first equation by -2, thus making the coefficient of $x = -4$, and then add the two equations and solve for y. Or we could multiply the second equation by 3, making the coefficients of $y = -3$ and 3, and then add the equations and solve for x. Let's try multiplying the first equation by -2. When we do this, we end up with:

$-4x + 6y = 4$. Now we add this to the second equation, so it looks something like this:

$\underline{4x + y = 4}$

$7y = 8$

Dividing both sides by 7 to get y on one side by itself, we have $y = 8/7$.

To find x, we will substitute 8/7 for y in one of the equations. Let's use the second equation, giving us: $4x + 8/7 = 4$. Multiplying each term by ¼ gives us $x + 8/28 = 1$ or, reducing the fraction, $x + 2/7 = 1$. We then subtract 2/7 from both sides to isolate the x, giving us $x = 1 - 2/7$ or $x = 5/7$. We now have our solution: (5/7. 8/7).

The third part of your worksheet contains systems of equations to solve using elimination. You may wish to do those now.

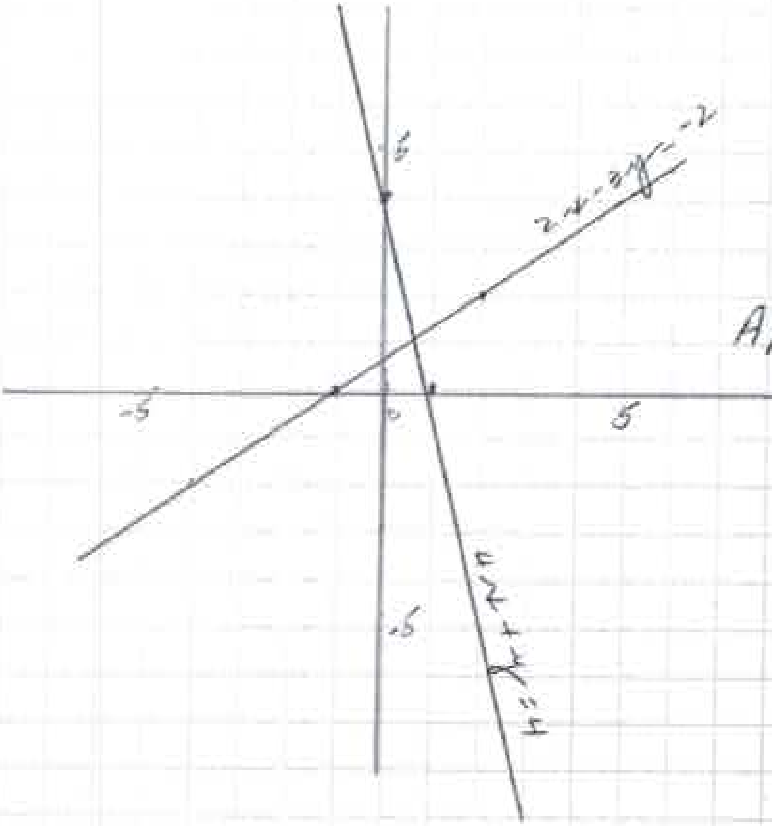
Part 4 – Use the method of your choice.

The final section of your worksheet contains a few problems for you to solve using whichever method you prefer. You may complete those now.

Our hope is that this method has been helpful to you in reviewing how to solve Systems of Equations. You may keep this example/instruction sheet. You will bring the worksheet with problems solved back to school the first day back.

Sample problem: $2x - 3y = -2$

$4x + y = 4$



Approximate Solution: $(\frac{2}{3}, 1)$

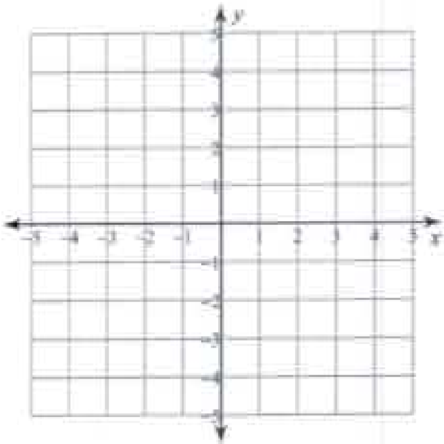
Algebra 2 Name________________________ ID: 1

Snow and Go Worksheet - Day 5

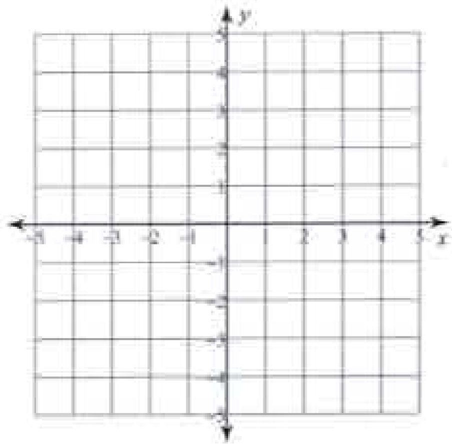
Date________________ Period____

Solve each system by graphing.

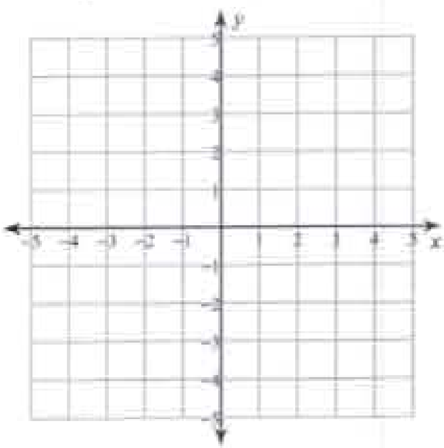
1) $x - 4y = -12$
$5x + 4y = -12$



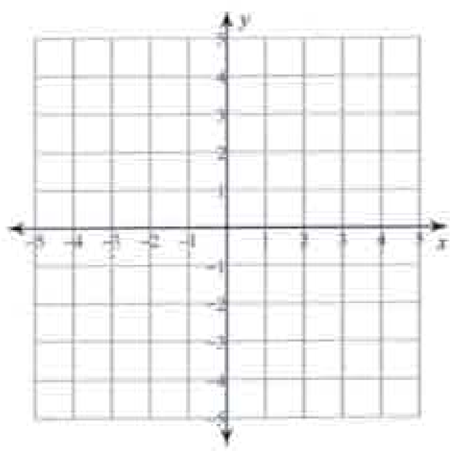
2) $3x + 4y = -8$
$3x - 4y = -16$



3) $4x + 3y = -9$
$x - y = -4$



4) $x + 2y = 6$
$x + 2y = -2$



Solve each system by substitution.

5) $3x + 7y = -18$
$x + 3y = -8$

6) $-6x - 5y = -24$
$y = 6$

7) $x - 3y = 12$
$-7x + 5y = -20$

8) $-2x - 4y = 12$
$x + 2y = -6$

Solve each system by elimination.

9) $14x - 12y = 15$
$-7x + 6y = -6$

10) $-12x - y = 28$
$4x - 3y = 4$

11) $-10x - 8y = -28$
$2x + 4y = 20$

12) $-9x - 12y = -30$
$-3x + 6y = 0$

Solve each system by the method of your choice.

13) $3x - 10y = 20$
$5x - 2y = 4$

14) $3x + 9y = -18$
$-x - 18y = -9$

15) $-3x + 18y = 21$
$-5x - 9y = -4$

16) $4x - 16y = -4$
$-2x + 8y = 2$