AMS 8 –Algebra I Summer Assignment
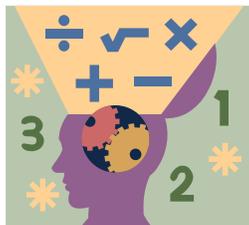
Dear Parents and Students:

All students entering Algebra I or Algebra I Honors in September are required to complete this assignment. This assignment is comprised of two components: a review of essential math skills and a project. There are ten topics included in the skills component which will prepare students with stronger math skills for the upcoming school year.

If you need assistance with any of the topics included in this assignment, we strongly recommend that you to use the following resource: http://www.khanacademy.org/.

If you would like additional practice with any topic in this assignment visit: http://www.math-drills.com.

Below are the POLICIES of the summer assignment:

- The summer assignment is **due the first day of class**. On the first day of class, teachers will collect the summer assignment. Any student who does not have the assignment will be given one by the teacher. Late projects will lose 10 points each day.

- This summer assignment will be graded on completion. Completion is defined as having all work shown in the space provided to receive full credit, and a parent/guardian signature. An assessment (administered during the first week of school) will be based on the topics covered in this packet.

- Any student who registers as a new attendee of Teaneck High School after August 15th will have an extra week to complete the summer assignment.

- Summer assignments are available on the district website and available in the THS guidance office.

HAVE A GREAT SUMMER!

Solving Equations

1. Kevin's scores on the first four science tests are 88, 92, 82, and 94. What score must he earn on the 5th test to earn an average of 90? Define a variable, write an equation, and solve.

2. Marla got 60% off a pair of shoes. If the shoes cost $9.75 (before sales tax), what was the original price of the shoes? Define a variable, write an equation, and solve.

3. Isari's recipe for strawberry smoothies requires ½ cup of sliced strawberries per drink. How many smoothies can she make using 8 cups?

4. Joseph mixed $5\frac{1}{2}$ gallons of orange drink for his picnic. Every ½ gallon requires 1 packet of orange drink mix. How many packets of orange drink mix did Joseph need?

5. $3x + 4 = 10$

6. $\frac{2}{3}x = 6$

7. $\frac{-x}{2} = 8$

8. $2.5x - 13 = 2$

9. $x - 1 + 2x = 1 + 11x$

10. $-12 = 9x - 6x + 15$

11. $-4(2x + 5) - 3x = 3.5$

12. $\frac{x+3}{5} = \frac{x-2}{4}$

13. $4x = \frac{1}{2}$

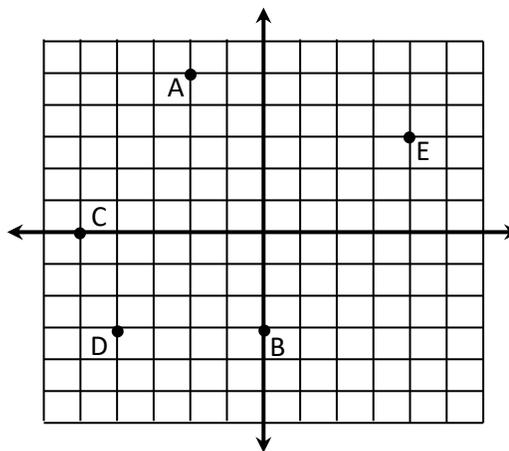14. $5x - (-8x) = 26$

Coordinate Plane

15. Use the coordinate plane on the right to answer each question.

    a. Name the point in Quadrant III.

    b. Name the point on the x – axis.

    c. Name the y – coordinate of Point D.
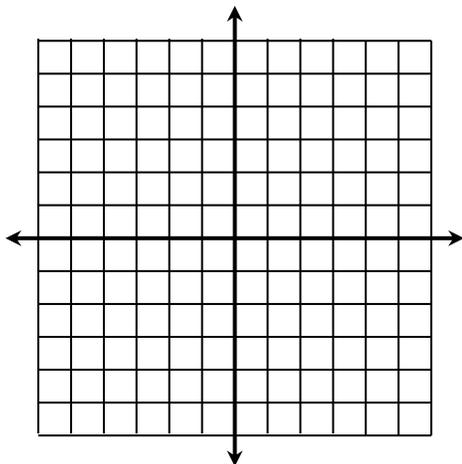
    d. Name point A as an ordered pair.

Slope

The slope is the constant rate of change of a line.

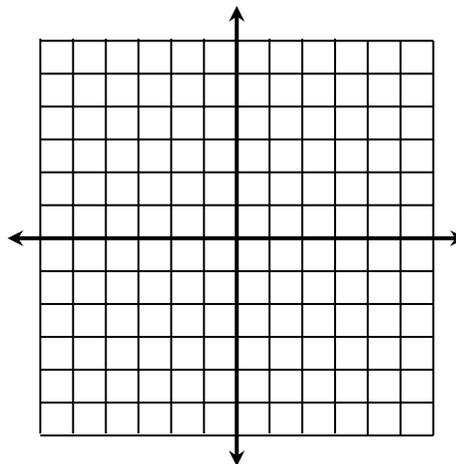**It is the** $\frac{rise}{run}$. **You can use the formula** $= \frac{y_2 - y_1}{x_2 - x_1}$.

16. Find the slope of the line that passes through (–1, –2) and (–4,1).

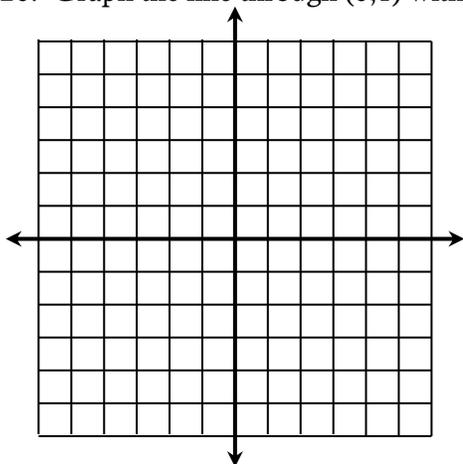17. Evaluate $\dfrac{a-b}{c-d}$ for the following values: a = –3, b= –3, c = 4, d=7

18. Draw a line with a slope of $\frac{1}{2}$

19. Draw a line with a slope of –2

20. Graph the line through (0,1) with a slope of $-\frac{1}{2}$.

Graphing Linear Equations

To graph a linear equation you can use a table of values or the slope and y-intercept. To draw the line using the slope and y-intercept, first plot the y-intercept on the y-axis then use the slope to draw the line.
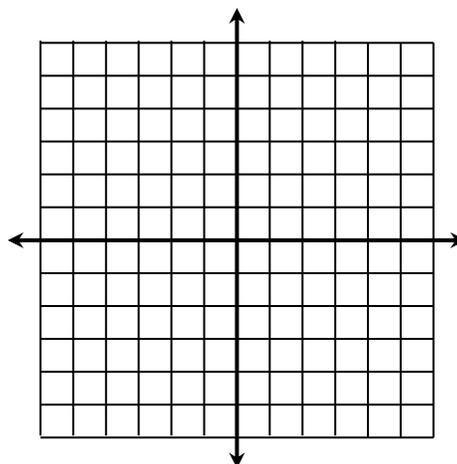
Remember: Slope–Intercept form is: $y = mx + b$, where m represents the slope and b represents the y-intercept.
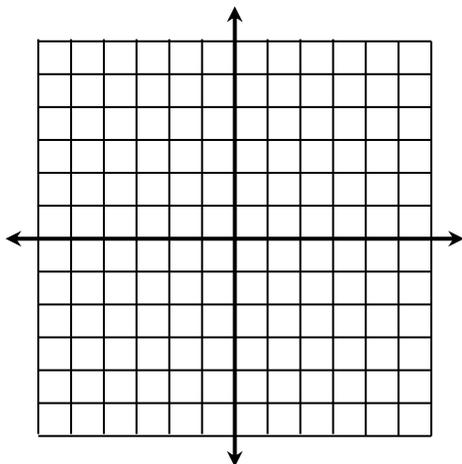
Graph the following linear equations.

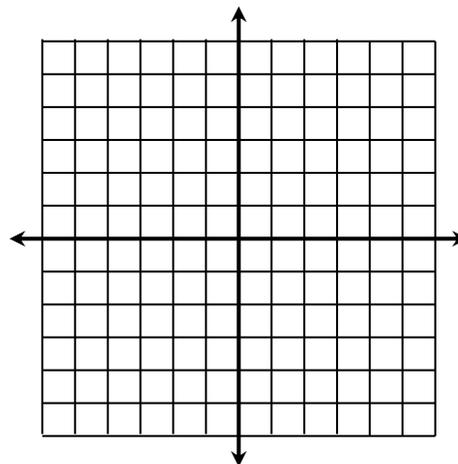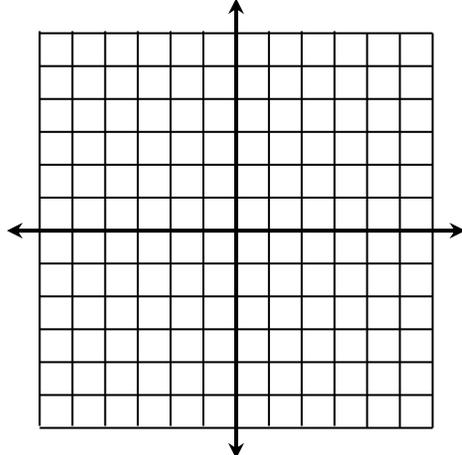21. $y = \frac{1}{2}x - 3$
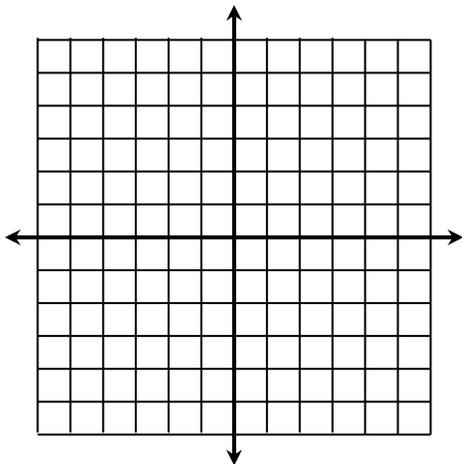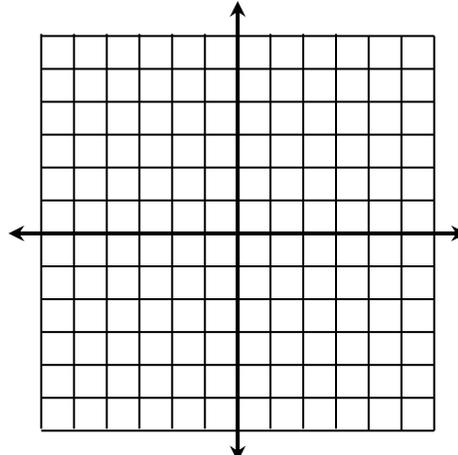
22. $y = -\frac{1}{3}x + 2$

23. $y = -x + 3$

24. $y = 2x$

25. $y = 2$

26. $x = 3$

4

Writing Linear Equations

To write the equation of a line given the graph:

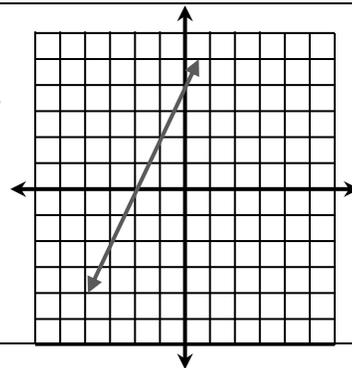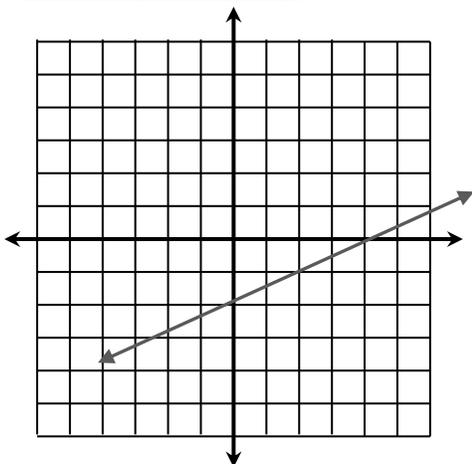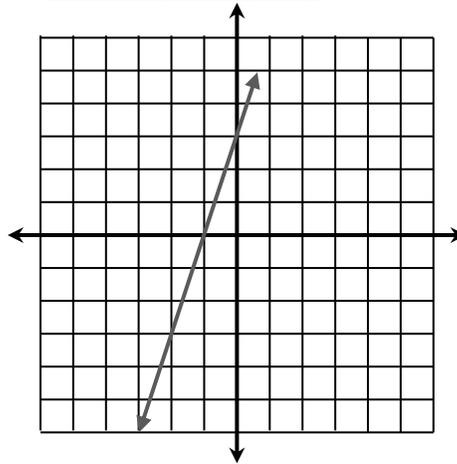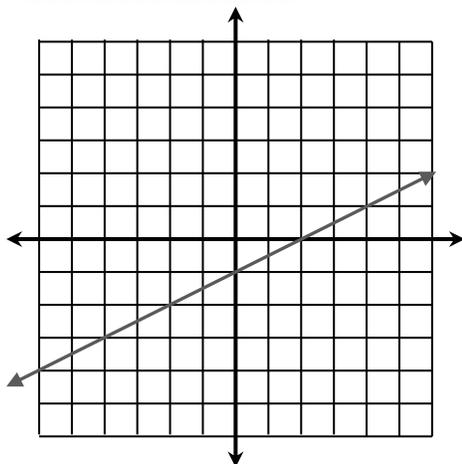|	
Step 1: Determine the slope **Step 2: Determine the y intercept** **Step 3: Write** $y = mx + b$ **Step 4: Replace** m **with the slope and** b **with the y-intercept**	**Example:** Step 1: The slope is 2. Step 2: The y-intercept is 4. Step 3: $y = mx + b$ Step 4: $y = 2x + 4$

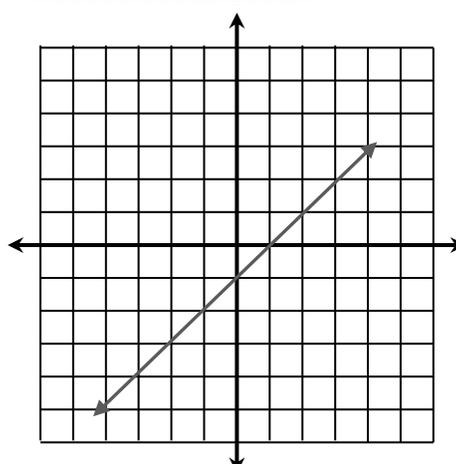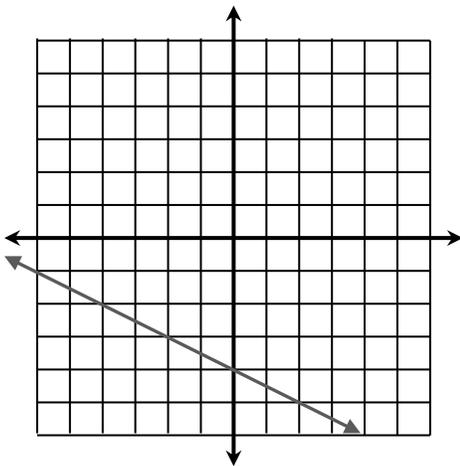Write an equation for each line.

27. _____

28. _____

29. _____

30. _____

31. _____

32. _____
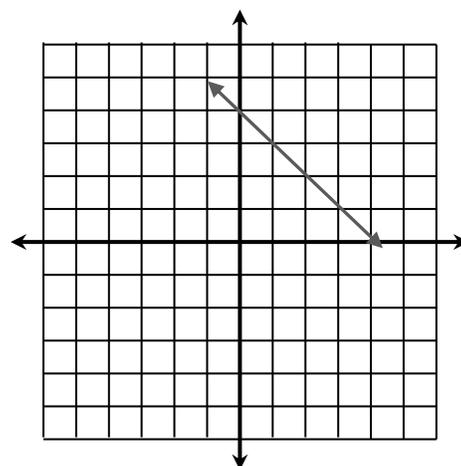
33. Is the point $(-3,2)$ on the line $y = -\frac{1}{3}x + 1$? Show work.

To write equations given the slope and a point

Step 1: Write $y = mx + b$ **Step 2: Replace** m **with the slope** **Step 3: Replace** x **and** y **, then solve for** b **Step 4: Write the equation**	Example: Slope (m) = 2 point: (1,6) Step 1: $y = mx + b$ Step 2: $y = 2x + b$ Step 3: $6 = 2(1) + b$ $6 = 2 + b$ $b = 4$ Step 4: $y = 2x + 4$

Write an equation of the line that passes through each point with the given slope.

34. (4, –2), m = 2

35. (3, 7), m = –3

36. (–3, 5), m = –1

37. (–3, 0), m = $-\frac{5}{3}$

6

To write equations given 2 points on the line

Step 1: Calculate the slope	Example:
Step 2: Write $y = mx + b$	Points: (2,8) and (1,6)
Step 3: Replace m with the slope	Step 1:
Step 4: Replace x and y, then solve for b	Slope $= \dfrac{\Delta y}{\Delta x} = \dfrac{8-6}{2-1} = \dfrac{2}{1} = 2$
Step 5: Write the equation	
	Step 2: $y = mx + b$
Note: You can use either point.	Step 3: $y = 2x + b$
	Step 4:
	$8 = 2(2) + b$
	$8 = 4 + b$
	$b = 4$
	Step 5: $y = 2x + 4$

Write an equation of the line that passes through each pair of points.

38. (5, 1) and (8, –2)

39. (6, 0) and (0, 4)

40. (5, 2) and (–7, –4)

41. (–3, 11) and (6,5)

42. The cost for 7 dance lessons is \$82. The cost for 11 lessons is \$122. Write a linear equation to find the total cost C for L lessons. Then use the equation to find the cost of 4 lessons.

Systems of Equations

A solution of a system of equations is an ordered pair of numbers that satisfies both equations.

Circle the correct answer for each question.

43. The solution to a system of linear equations is given by which feature of the equations' graph

   A. their slopes

   B. their y – intercepts

   C. the coordinates of their intersection

   D. their point – slope form

44. A set of two equations with the same graph has how many solutions?

   A. no solution

   B. one solution

   C. two solutions
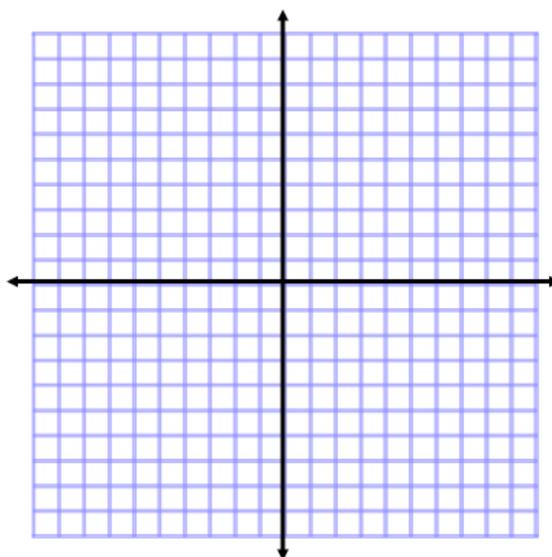
   D. infinitely many solutions

45. Is (1, 2) a solution to the system $\begin{cases} x + 3y = 7 \\ 2x - 4y = -6 \end{cases}$? Show work.

46. Is (–2,–4) a solution to the system $\begin{cases} y = 2x \\ 4x - y = -4 \end{cases}$? Show work.

47. Solve the system by graphing: $y = -3x + 1$

   $y = 2x + 1$

8

How to solve a System of Linear Equations by Substitution:

Step 1: Solve one of the equations for one of the variables. Hints: You can solve for either variable. This step may already be done for you.

Step 2: Substitute the expression from Step 1 into the other equation and solve for the other variable.

Step 3: Substitute the value from Step 2 into one of the original equations and solve.

Step 4: Write your answer as an ordered pair.

Step 5: Check that your solution works in both equations.

Solve the system of equations using the Substitution Method. SHOW ALL WORK.

48. $\begin{cases} y = -2x - 9 \\ 6x - 5y = -19 \end{cases}$

49. $\begin{cases} -x + y = 3 \\ 3x + y = -1 \end{cases}$

To solve a system of linear equations by elimination:

Step 1: Multiply, if necessary, one or both equations by a constant so at least one pair of like terms has the same or opposite coefficients.

Step 2:

Solve the system of equations using the ELIMINATION METHOD. SHOW ALL WORK.

50. $\begin{cases} 3x + 2y = 4 \\ 3x - 2y = -4 \end{cases}$

51. $\begin{cases} -10x + 3y = 1 \\ -5x - 6y = 23 \end{cases}$

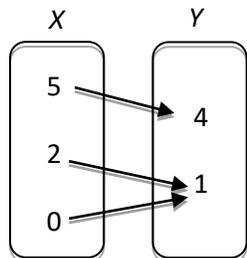52. $\begin{cases} 4x - 3y = 8 \\ 5x - 2y = -11 \end{cases}$

53. $\begin{cases} 8x + 3y = -9 \\ 8x - y = -29 \end{cases}$

Functions:

A function is a relation in which each input has <u>exactly one</u> output.

Determine whether each relation is a function. Write YES or NO on the line provided.

54.

55.

_____

_____
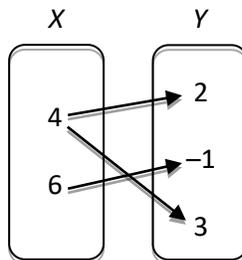
56.
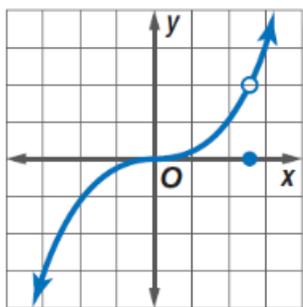
57. $\{(-1,1), (1, 2), (-1, 3), (2, 2)\}$

_____

58.

X	−2	−1	2	4
y	4	3	1	5

_____

_____

Determine whether each relation is a function and then graph each equation.

59. $x = 4$ Function? Circle YES or NO

60. $y = -2x + 1$ Function? Circle YES or NO

Performance Task

Introduction:

You and your family are moving, because your current home is old and too small. The good news is that you are moving two blocks away from your current home, and your new home has an upstairs which consists of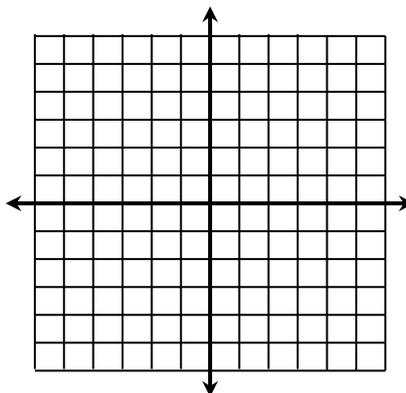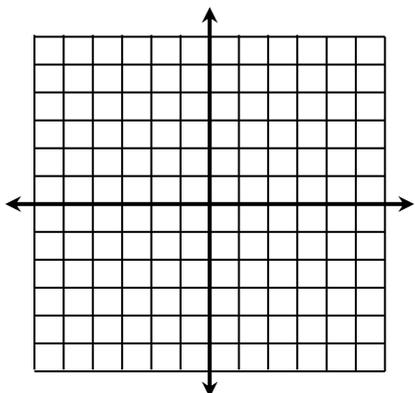 two bedrooms (one for you and one for your sibling), a spare room (that can be anything you want), and two closets. Your family has decided that you will be in charge of decorating the entire second floor.

The Task:

Your task is to decorate and furnish the second floor all by yourself!   You get to select the paint, wallpaper, carpet, tile, and furniture, and get to pick the colors, the designs/styles, and products that you and your sibling like best. You have a limited budget of $2,500.00 and your family wants to know how much each item will cost so you will need to keep track of everything you buy.

You have been given a huge responsibility, but you can handle it. Remember to measure the dimensions of each room to figure out how much paint, carpet, etc. you will need and avoid purchasing unnecessary materials.

To complete this task, follow the steps listed below:

1. Develop a proposal for the second floor of your house. Begin by writing a paragraph explaining your design plan to your family.

2. Create a floor plan drawing and list the dimensions of each room to show your family.

3. Calculate the perimeter and the area for each room (include this information on the floor plan). Remember, when doing calculations you will need to take into consideration any doors or windows. Make sure you keep these dimensions on hand, because you will need them when figuring the amount of supplies you will need.

4. Choose products that you like best, but remember you are on a limited budget. You will need to do the following to each room:

   - Carpet or tile the floor
   - Paint or wallpaper the walls and ceiling
   - Choose furniture and accessories for decorating the rooms. Then make a table listing the products you will purchase to decorate the second floor. Be sure to include the room name, room dimensions (including area and perimeter), the product description (paint, tile, carpet, accessories, etc.), as well as pricing and the store from which you will purchase the material.

5. Neatly assemble your proposal, floor plan, calculations, and the table listed above.

You will be able to obtain information for this project from the following resources:

Carpet and Tile:

smartinternetguide.com

carpetcorner.com

Paint:

benjaminmoore.com

sherwinwilliams.com

Furniture:

yahooshopping.com

pier1.com

Have fun!