Task 1: Community Park[1]

Your town has decided to build a new community park. Your task is to create a graph that the construction workers and landscapers will use as a guide. Your graph should be neat and detailed. In addition, you must show how to solve the systems of linear equations algebraically, explain why you chose the method you did to solve each system, and include any additional work to complete the requirements listed below.

The community park will sit on a piece of land which measures 150 meters by 180 meters. The x-axis is the southern border of the property (180 meters long) and the y-axis is the western border of the property (150 meters long). Due to parking and other restrictions, the community park only takes up a portion of the plot of land. The boundaries for the park are described by the four equations below.

$$5x+12y=300$$
$$12x-5y=-125$$
$$5x+12y=1990$$
$$19x-22y=1140$$

The developers are not too far along in their planning, but they have decided the placement of the fenced in basketball court. The northeast corner of the rectangular basketball court is at the intersection of $2x - 5y = -255$ and $2x + 3y = 585$. The court extends 20 meters directly south from the given corner (this is the shorter side of the basketball court). The sides of the rectangular basketball court are in a 3:2 ratio. Sketch the perimeter of the basketball court on your park grid. Then, find the percentage of the total area of the park the basketball court covers. Be sure to include all of the computations required to find the percentage.

As another requirement of the park design, you must include two pathways that go along the diagonals of the park (connecting the vertices of the quadrilateral). Include the equations of the diagonal lines that run down the center of the two pathways and the point of intersection of the center of the two pathways. Choose a feature (i.e. fountain, rose garden, bench, tree, fish pond, gazebo, etc.) to place at the intersection of the two pathways.

The developers will get back to you with more details for the community park after the next meeting. Your task at this point in the planning stage is to create the graph containing the four sides that outline the community park and include a sketch of the location of the basketball court and the two pathways. They will use this outline to continue planning!

[1] Designed by http://csdecurriculumtaskforce.wikispaces.com/Algebra+Curriculum

Checklist

_____ 1) The x- and y-axes of the coordinate plane are labeled and appropriate scales are indicated.

_____ 2) The four lines that create the boundaries of the park are correctly graphed and labeled.

_____ 3) The basketball court is correctly placed, labeled, and is in proportion to the given scale of the park design.

_____ 4) You have found the percentage of the area of the basketball court compared to the total area of the park. You have included all the work needed to calculate the percentage.

_____ 5) The pathways are correctly placed and labeled and are the correct length given the scale of the graph. The equations of the two pathways are written and the intersection is labeled with the coordinate pair.

_____ 6) You have attached work that show how you solved each system of equations.

_____ 7) You have explained why you chose the method you used to solve each system of equations.

_____ 8) You have used correct spelling, grammar and sentence structure in the written explanations of your work.

Graph for Task:
https://docs.google.com/document/d/104gHJAqU_C0_XxXtmEIlI-Y7C2D6cfJ3zjoblACtcyU/edit