All For One, One For All
A Solidify Understanding Task

Carlos and Clarita have found a way to represent combinations
of cats and dogs that satisfy each of their individual "Pet Sitter"
constraints, but they realize that they need to find combinations that satisfy all of the constraints
simultaneously. Why?

1. Begin by listing the **system of inequalities** you have written to represent the *start-up costs*
    and *space* "Pet Sitter" constraints.

2. Find at least 5 combinations of cats and dogs that would satisfy both of the constraints
    represented by this system of inequalities. How do you know these combinations work?

3. Find at least 5 combinations of cats and dogs that would satisfy one of the constraints, but
    not the other. For each combination, explain how you know it works for one of the
    inequalities, but not for other?

4. Shade a region on a coordinate grid that would represent the **solution set to the system of
    inequalities.** Explain how you found the region to shade.

5. Rewrite your systems of inequalities to include the additional constraints for *feeding time*
    and *pampering time*.

6. Find at least 5 combinations of cats and dogs that would satisfy all of the constraints
    represented by this new system of inequalities. How do you know these combinations
    work?

7. Find at least 5 combinations of cats and dogs that would satisfy some of the constraints, but
    not all of them. For each combination, explain how you know it works for some inequalities,
    but not for others?

8. Shade a region of a coordinate grid that would represent the solution set to the system of
    inequalities consisting of all 4 "Pet Sitter" constraints. Explain how you found the region to
    shade.

9. Shade a region in quadrant 1 of a coordinate grid that would represent all possible
    combinations of cats and dogs that satisfy the 4 "Pet Sitter" constraints. This set of points is
    referred to as the **feasible region** since Carlos and Clarita can feasibly board any of the
    combinations of cats and dogs represented by the points in this region without exceeding
    any of their constraints on time, money or space.

10. How is the feasible region shaded in #9 different from the solution set to the system of
    inequalities shaded in #8?

All For One, One For All, part 1
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Carlos and Clarita have found a way to represent combinations of
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1. Begin by listing the **system of inequalities** you have written to represent the *start-up costs*
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   represented by this system of inequalities. How do you know these combinations work?

3. Find at least 5 combinations of cats and dogs that would satisfy one of the constraints, but
   not the other. For each combination, explain how you know it works for one of the
   inequalities, but not for other?

4. Shade a region on a coordinate grid that would represent the **solution set to the system of
   inequalities.** Explain how you found the region to shade.

5. Shade a region in quadrant 1 of a coordinate grid that would represent all possible
   combinations of cats and dogs that satisfy the start-up costs and space "Pet Sitter"
   constraints.

6. How is the region shaded in #5 different from the solution set to the system of inequalities
   shaded in #4?

All For One, One For All, part 2
A Solidify Understanding Task

Carlos and Clarita are trying to find a way to represent combinations of cats and dogs that satisfy all four of their "Pet Sitter" constraints.

So far, they have examined the **system of inequalities** that represents the *start-up costs* and *space* "Pet Sitter" constraints. They shaded a region that represented the solution set to this system of inequalities, and realized that the portion of this shaded region that lies in the first quadrant would contain the points that represent combinations of cats and dogs for which they have space and can afford to purchase pens and runs for their summer business. Now they are wondering how their time constraints will affect the solution set.

1. Rewrite your systems of inequalities to include the additional constraints for *feeding time* and *pampering time*. That is, you should now have a system of inequalities that contains all four constraints.

2. Find at least 5 combinations of cats and dogs that would satisfy all of the constraints represented by this new system of inequalities. How do you know these combinations work?

3. Find at least 5 combinations of cats and dogs that would satisfy some of the constraints, but not all of them. For each combination, explain how you know it works for some inequalities, but not for others?

4. Shade a region on a coordinate grid that would represent the solution set to the system of inequalities consisting of all 4 "Pet Sitter" constraints. Explain how you found the region to shade.

5. Shade a region in quadrant 1 of a coordinate grid that would represent all possible combinations of cats and dogs that satisfy the 4 "Pet Sitter" constraints. This set of points is referred to as the **feasible region** since Carlos and Clarita can feasibly board any of the combinations of cats and dogs represented by the points in this region without exceeding any of their constraints on time, money or space.

6. How is the feasible region shaded in #5 different from the solution set to the system of inequalities shaded in #4?