

Flower Gardens

1. Polly Petals runs a small business creating flower gardens for people in her community. As spring approaches, the following customers have provided the dimensions of different flower gardens each would like to have created.
 - Rose Bush has a rectangular space with lengths of $3x + 1$ and $2x + 7$.
 - Iris Orchid has a rectangular space with lengths $4x + 2$ and $x + 5$.
 - Sonny Flower has a square space with lengths of $4x + 2$.
 - a. Sketch the shape of each design to represent the space available for the flower gardens of each customer (label the lengths). Determine the area of space available for each customer. Show work to justify each answer.
 - b. Determine the total area of space Polly must work with for all her customers.

2. Rose has determined that she has another rectangular space in the front of her garage where she would like to add a flower garden with the same measurements as the first space.
 - a. Determine the total area of space that Rose now has for both of her flower gardens.
 - b. With the inclusion of Rose's second flower garden, determine the total area of all of the spaces that Polly must work with for all her customers.
 - c. Iris Orchid has later determined that she does not want to use her entire rectangular space and instead will use a square shaped space with similar sides of $4x + 2$. Determine her new area of space as well as the total space that Polly now must work with.

3. Iris and Sonny are neighbors and have decided to combine their flower gardens.
 - a. Sketch a picture to represent what Iris and Sonny's garden will look like.
 - b. Determine the area of space that is now needed for their combined garden. Show work to justify your solution.

4. Iris has decided to change the size of flower garden.
 - a. Iris decides to cut the side length $4x + 2$ of her rectangular space in half, determine her new area of space. Sketch a visual representation of the math used to determine your answer. Write a polynomial expression to justify your answer.
 - b. What polynomial expression would result if Iris had enough to double the side length $4x + 2$ of her flower garden?