OPTIMIZING WITH CONSTRAINTS PRACTICE – WHOLE NUMBERS

1. A rectangular section of a lawn is to be fenced. Because one side of the law is bordered by the house, only 3 sides need to be fenced. The fenced section should have an area of 20 m2. Determine the minimum perimeter and dimensions of the section if the side lengths must be whole numbers.
2. A rectangular swimming area is to be marked with buoys. Because one side of the swimming area is bordered by the beach, only 3 sides need to be marked. The swimming area must be 32 m2. Determine the minimum perimeter and dimensions of the swimming area if the side lengths must be whole numbers.
3. A rectangular dog run is being made, with 20 m of fence. Determine the maximum possible area of the dog run and the dimensions, if the side lengths must be whole numbers.
4. The Tengs are adding a rectangular sunroom to their house. The perimeter of the sunroom will be 45 feet, not including the wall that is part of the house. Determine the maximum possible area of the room and the dimensions, if the side lengths must be whole numbers.

CHALLENGE: The Tengs are now considering designing their sunroom in the shape of a semicircle. Determine the diameter and area of this room.