Area and perimeter homework:

1. Given that these dots are horizontally 1 cm apart (they may not be exactly right after you print them), how long is this line segment? Two common answers would be 5 cm and 6 cm. Explain which one is right, and explain what the misconception is that leads to the wrong answer.



2. Given that these dots are horizontally and vertically 1 cm apart (they may not be exactly right after you print them), is the diagonal line segment exactly 1 cm long? Explain why or why not.



3. In your math kit there is a yellow clock for teaching time. Using a string and a ruler or a flexible tape measure, measure the perimeter of the clock in both cm and inches. Record your answers here.

4. Using the bottom corner of a piece of paper as a right angle, draw a right angle where the sides next to the right angle are 6 cm long and 9 cm long. Measure the length of the hypotenuse with a ruler and find the length of the perimeter.

5. a. Given that these dots are horizontally and vertically 1 cm apart, find the area of this shape by counting whole and half units. Show your work and process:



b. Given that these dots are horizontally and vertically 1 cm apart, find the area of this shape by

* splitting it into rectangles where you can
* multiplying to find the areas of the rectangles
* adding up the areas of the rectangles
* adding on the areas of the other (non-rectangle) parts

Show your work and process:



6. Using the square tiles or single cubes in your math kit, investigate the following question:

Of all of the rectangles that have the *same area*, how are the ones with the *shortest perimeters* different from the ones with the *longest perimeters*? If you wanted to make a rectangle with a short perimeter, how would you do it? If you wanted to make a rectangle with a long perimeter, how would you do it?

Suggestions for investigating (you can follow some, all or none of my suggestions):

* If you choose a particular number of tiles to use to make rectangles, then the area of the rectangle will be the same as the number of tiles you picked. Rectangles made with the same number of tiles will all have the same area, but may have different perimeters.
* A good way to start is to pick a number of tiles to start with (I suggest the numbers 12, 16, 20 and 24 as good choices), and make all the different shaped rectangles you can make with that number of tiles, and keep track of what the perimeters are of each of the rectangles.
* Record your rectangles by drawing them on graph paper. Group together the ones with the same area, and write the perimeter of each rectangle next to it.
* Circle the rectangles with the smallest perimeters and put a star next to the ones with the largest perimeters so you can compare them
* Remember that a square is a special kind of a rectangle (so if you can make a square, you should include it in your list)
* Rectangles that are turned around have the same perimeter, so if you have a 2x6 rectangle, you probably don’t need to draw a 6x2 rectangle.
* Remember that rectangles can be long and skinny: a 1x12 rectangle is still a rectangle.

When you have figured out the patterns, please write an answer where you:

a. Explain what you did to investigate the question (did you use any of my suggestions? What else did you do? What do you think helped you the most?)

b. Explain what you should do if you are trying to make a rectangle with the longest perimeter you can.

c. Explain what you should do if you are trying to make a rectangle with the shortest perimeter you can.