1. Create two expressions that can be used to represent the following rectangular objects and explain how they represent it: (5 points)

Note that the above rectangle is filled with both black and white blocks.

1. If I assume that each small block is 1 unit x 1 unit in dimensions, then I can write the area of the large rectangle to be the following expression: $5 \times 7$

2. If I want an expression that describes the portion of the large rectangle covered in black blocks, then I can write the expression $\frac{18}{35}$ there are 18 black blocks out of the 35 total blocks.

* There are many possible solutions to this question, as long as you can justify your expression effectively.

2. Now create one equation that represents the above rectangular object and explain the difference between an expression and an equation. (5 points)

$$5 \times 7 = 35 \text{ sq units}$$

This equation describes the area of the large rectangle, under the assumption that each small block is 1 unit x 1 unit in dimension.

* There are many possible solutions to this question as well, as long as you can justify your expression effectively.
3. A fellow classmate has been working with the following pattern below:

![Pattern Diagram](image)

Note that the above consists of two complete pattern cycles.

Your classmate thinks that the first 52\textsuperscript{nd} entries uses eight complete pattern cycles and the 52\textsuperscript{nd} object in the sequence a \(\triangleleft\) (lightning bolt).

(a) First determine if your classmate's thoughts are correct. (1 point)

No, my classmate is incorrect.

(b) If your classmate is correct, explain how you know. If your classmate is incorrect explain how you know, and explain how you know how many pattern cycles are in the first 52\textsuperscript{nd} entries and what will be the 52\textsuperscript{nd} object in the sequence. (4 points)

I know my classmate is incorrect because 52 divided by 6 is 8 with a remainder of 4. This means that there are 8 complete pattern cycles, but 4 more objects are needed to get to the 52\textsuperscript{nd} object in the sequence. The 4\textsuperscript{th} object in the pattern is a smiley face. So the 52\textsuperscript{nd} object is a smiley face not a lightning bolt.