1. (a) 10 (b) 30

2. Refer to the letters in the below diagram.

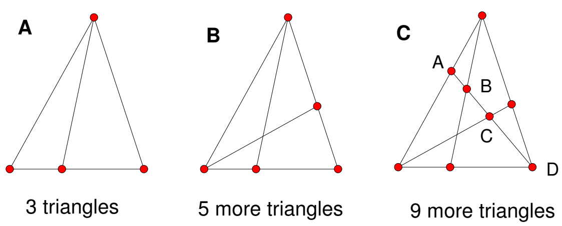
(a) First, consider only $\triangle OAB$. From Problem 1, there are 10 such triangles. Then, consider only $\triangle OAC$. We have another 10 triangles. Lastly, consider $\triangle BAC$. We have an additional 4 triangles in this region. So there are $\boxed{24}$ triangles.

(b) In each of $\triangle ODE, \triangle ODF, \triangle OBF, \triangle OBC$, we have 10 triangles. In each of $\triangle DEF, \triangle DFB, \triangle FBC$, we have 4 triangles. Thus there are $40 + 12 = \boxed{52}$ triangles.

3. $\boxed{15}$

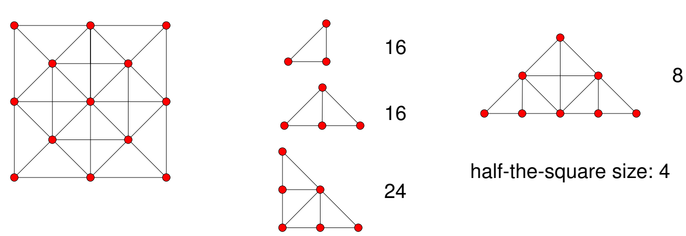
4. We have drawn in 10 lines from B between A and C. Thus we have 12 lines. Use combinations to determine how many angles there are. Since there are 12 lines and we choose 2 to create an angle, there are $\binom{12}{2} = \frac{12!}{2!10!} = \frac{12 \cdot 11}{2} = 66$. However, the problem asks for angles LESS than 90, and $\angle ABC$ is exactly 90, so we subtract one and get $\boxed{65}$.

5. Use constructive counting. In figure A, we have the most basic form of the image, where there are 3 triangles. In figure B, we add a line, which adds 5 possible triangles. In figure C, to determine how many new triangles are added by the third line, we will consider how many triangles are added by each segment.



Segment AB adds 1 triangle, segment BC adds 1, and CD adds 2. Segment AC adds 1 and BD adds 2, and the whole segment AD adds 2. So in all, 9 triangles are added by the third segment. This means we have $3 + 5 + 9 = \boxed{17}$ triangles.

6. Count by size.



This gives a total of $\boxed{\text{68 triangles}}$.