1. On the following picture there is a regular pentagon. Inside the pentagon on the side AB is a square. Inside the square is an equilateral tringle BCD. Find the angle $\angle CDE$.
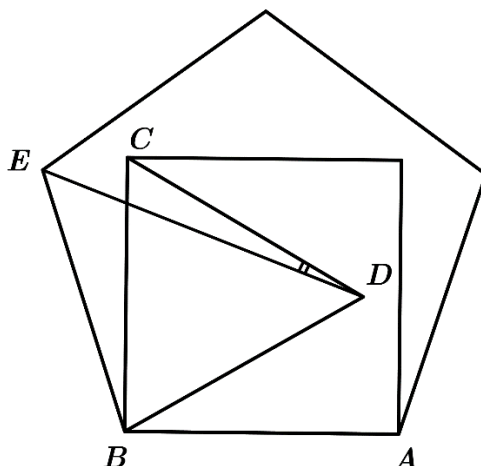

   Note: white the answer in degrees.

2. In the following equality, different letters denote different digits, and identical letter denote identical digits

$$CAT \cdot CAT = CTHAT$$

   Find the number CAT.

   Note: in this problem letters denote digits in 3- and 5-digit numbers.

3. Ayala made the following figure: she glued together two regular hexagons so that the long diagonal of one of them coincides with the short diagonal of the other one. The resulting polygon is a non-regular heptagon. The area of the smaller of the hexagons is 36. Find the area of the heptagon.
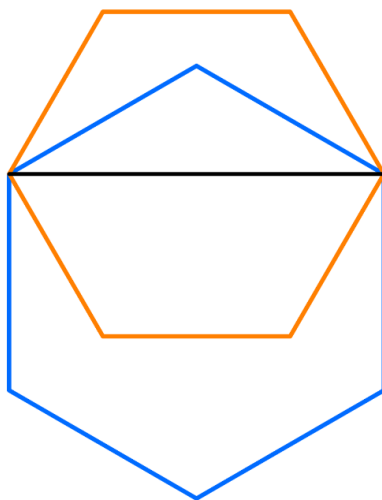
4. Find a value of x for which

$$\sqrt{120 - \sqrt{x}} + \sqrt{120 + \sqrt{x}} = 20$$

5. A 6×8 rectangle is tiled by tiles of two kinds: green tiles and orange tiles, whose shapes are shown in the following picture. What is the least possible amount of the green (rectangular) tiles in the tiling?
    Note: you are allowed to rotate the tiles. The tiles must cover the whole rectangle without overlapping, all tiles must be fully inside the rectangle.
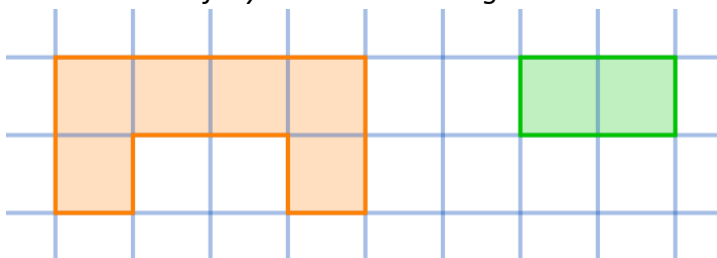
6. A positive integer number is called *nice* if it is a composite number, and it's biggest digit is equal to it's biggest divisor that is not itself. Find the sum of all the nice numbers.
    Note: A composite number is an integer number that is greater than 1 and is not prime.

בהצלחה!