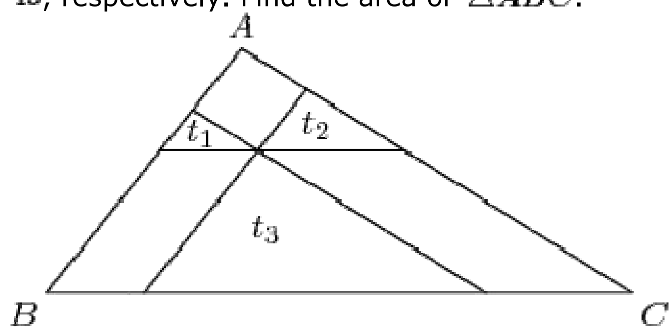
1. A point P is chosen in the interior of $\triangle ABC$ such that when lines are drawn through P parallel to the sides of $\triangle ABC$, the resulting smaller triangles t_1, t_2, and t_3 in the figure, have areas 4, 9, and 49, respectively. Find the area of $\triangle ABC$.



2. The function f is defined on the set of integers and

satisfies $$f(n) = \begin{cases} n-3 & \text{if } n \geq 1000 \\ f(f(n+5)) & \text{if } n < 1000 \end{cases}$$

Find $f(84)$.

3. Assume that a, b, c, and d are positive integers such that $a^5 = b^4$, $c^3 = d^2$, and $c - a = 19$. Determine $d - b$.

4. Suppose that $x_i| < 1$ for $i = 1, 2, \ldots, n$. Suppose further that $x_1| + |x_2| + \cdots + |x_n| = 19 + |x_1 + x_2 + \cdots + x_n|$. What is the smallest possible value of n?

5. In a shooting match, eight clay targets are arranged in two hanging columns of three targets each and one column of two targets. A marksman is to break all the targets according to the following rules:

1) The marksman first chooses a column from which a target is to be broken.
2) The marksman must then break the lowest remaining target in the chosen column.

If the rules are followed, in how many different orders can the eight targets be broken?

6. A positive integer is called ascending if, in its decimal representation, there are at least two digits and each digit is less than any digit to its right. How many ascending positive integers are there?