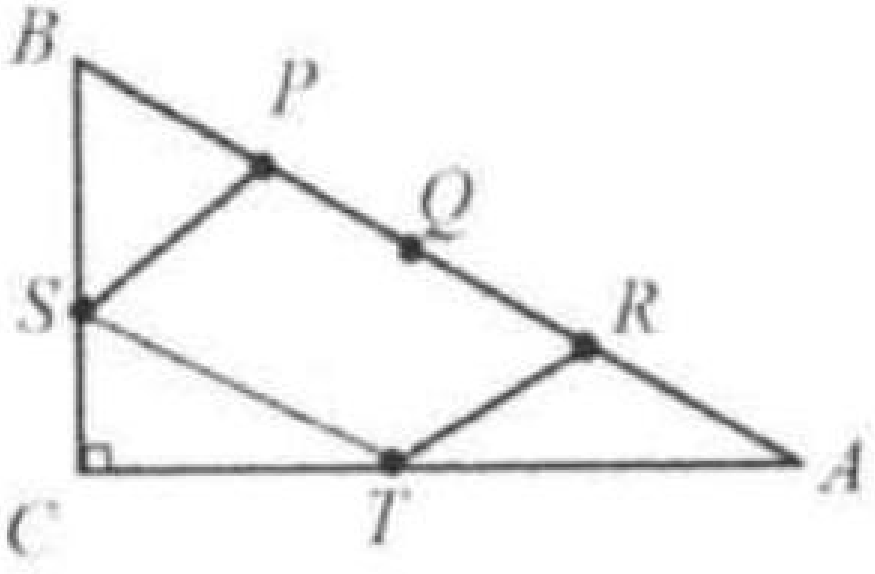
Problem

(Phillips Academy Prize Exam) In right triangle ABC, angle C is the right angle. P, Q and R are points which divide AB into four equal parts. S and T are the midpoint of BC and AC, respectively. AB equals 24 inches. Find the perimeter of PRST.



Solution

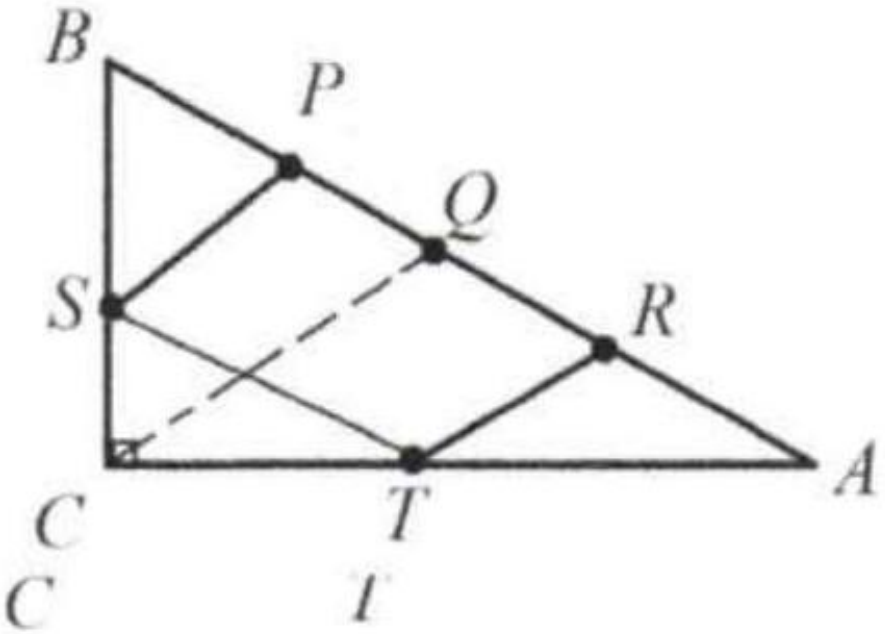
36.

Draw median CQ. Since the median to the hypotenuse of a right triangle is half the hypotenuse,

$CQ = \frac{1}{2}AB = \frac{24}{2} = 12.$

Since SP, RT, and ST are midlines,

$SP = \frac{1}{2}CQ = \frac{12}{2} = 6 = RT$ and $ST = \frac{1}{2}AB = \frac{24}{2} = 12.$



The perimeter of PRST is 36 .