

Problem # 1DATE: 11/14/06

People that worked on this solution:

Name	Teacher	Name	Teacher
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Good Luck and have fun!

$$\textcircled{1} \quad \frac{5(5+1)}{2} = \frac{30}{2} = 15 \text{ cubes}$$

$$\textcircled{2} \quad \frac{9(9+1)}{2} = \frac{90}{2} = 45 \text{ cubes}$$

$$\textcircled{3} \quad \frac{45(45+1)}{2} = \frac{2,070}{2} = 1,035 \text{ cubes}$$

$$\textcircled{4} \quad \frac{115(115+1)}{2} = \frac{13340}{2} = 6,670 \text{ cubes}$$

$\textcircled{5}$ I noticed that if you add the number of steps in the stairway plus every step before it, you find the number of cubes. So, for 5 steps, $5+4+3+2+1 = 15$ cubes. I tried different ideas to make the equation. Then I realized that you could also add the numbers

this way:

for 5 steps -

5

4

3

$$\begin{array}{r} 1 \\ \times 2 \\ \hline 2 \\ 4 \\ \hline 6 \end{array}$$

3 sets of 5 makes 15

This helped me come up with the equation:

$$\frac{n(n+1)}{2} = \text{number of cubes}$$

where $n = \text{number of steps}$