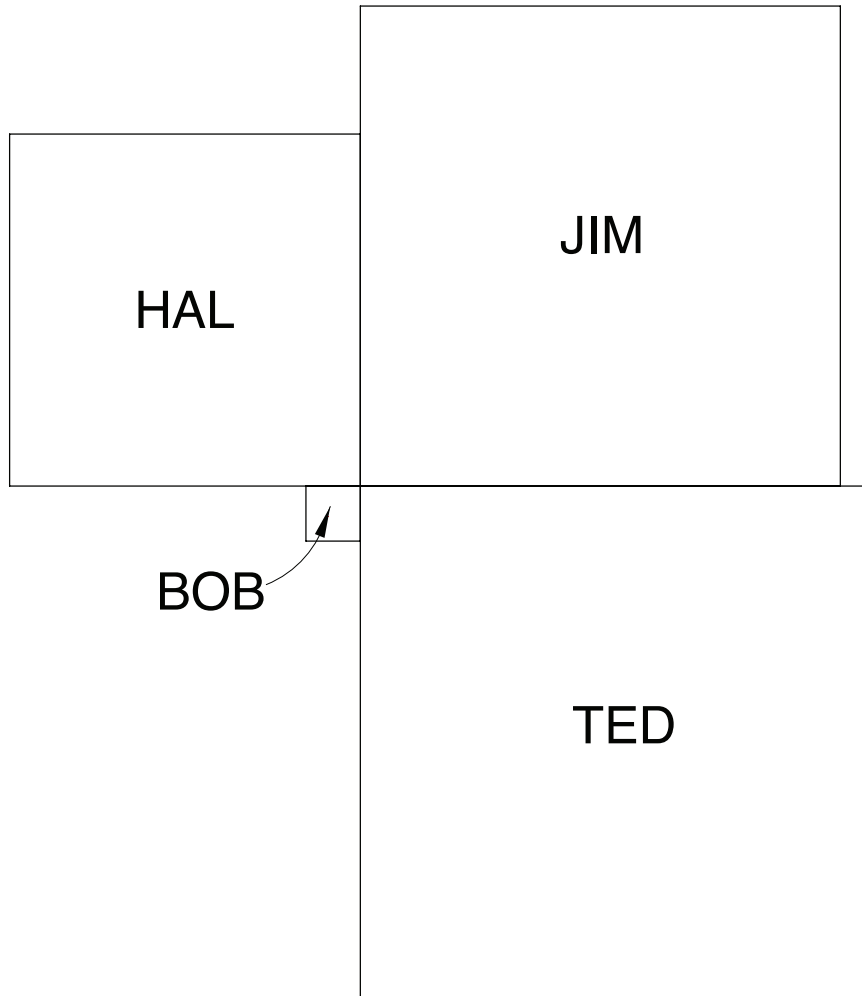


Problem  
**158**

by Dave Lindell, L.S.

### Dividing Farm Land



Farmer Fred gave his four sons those portions of his estate described as being square parcels such that the area of Jim's plot in square miles must equal the side of Hal's plot in miles plus two. Ted's area must equal a side of Jim's square plus two. Hal's area added to the side of Bob's plot must equal two, and Bob's area plus the length of Ted's square must equal two. What are the areas of each plot?

Solutions are on our website at [www.profsurv.com](http://www.profsurv.com)

**Problem  
159**

by Benjamin Bloch, Ph.D.

**Single Digit Quality: Factorials**

The factorial of a number is the value of that number when it is multiplied by all of its preceding numbers. The factorial operation is designated by an exclamation mark. Thus, 5 factorial means the value obtained by the operation  $5 \times 4 \times 3 \times 2 \times 1$  and is written as 5!

The following table lists the first 22 numbers and their factorial values. Your problem is to fill in the missing values for the SUM OF DIGITS and SDQ columns.

*Review: SDQ or Single Digit Quality for any number is obtained by adding all of the digits until a single digit remains, the SDQ of that number.*

**SDQ OF FACTORIALS**

n	n!	SUM OF DIGITS	SDQ
1	1	1	1
2	2	2	2
3	6	6	6
4	24	6	6
5	120	3	3
6	720		
7	5,040		
8	40,320		
9	362,880		
10	3,628,800		
11	39,916,800		
12	479,001,600		
13	6,227,020,800		
14	87,178,291,200		
15	1,307,674,368,000		
16	20,922,789,888,000		
17	355,687,428,096,000		
18	6,402,373,705,728,000		
19	121,645,100,408,832,000		
20	2,432,902,008,176,640,000		
21	51,090,942,171,709,440,000		
22	1,124,000,727,777,607,680,000		