



The Math Forum
PEOPLE LEARNING MATH TOGETHER

The Whole Problem-Solving Process: Traversing the Chasms Between Thinking, Talking, Writing, and Typing Mathematics

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Wooden Legs

Zaire's Solution

Answer:

I did 5 stools and 4 tables because. we did 3 legged stools and 5 times and 5 times 3 will be 15 add 16 it will be 31

Explanation:

hi miss suzanne

Elizabeth's Solution

Answer:

so far we found 6 ways she can build 3leg stools and 4leg tables.these is my 6 ways

Explanation:

in order to get my answer i used materials in counted 1 stool and 7 tables because $31/7$ is 7 remainder of 1 in $4+3$ is 7.

	Oral	Written
Communicating to organize your thoughts and explore	<ul style="list-style-type: none"> • Working on problems in small groups • Group brainstorming • Reaching shared understanding of a situation 	<ul style="list-style-type: none"> • Writing noticings and wonderings about a problem scenario • Highlighting or circling key words • Carrying out calculations • Making a table • Testing values
Communicating to ask questions	<ul style="list-style-type: none"> • Asking peers what they did • Asking a teacher for help (beyond saying "I don't get it.") • Asking a peer for help • Asking for clarification 	<ul style="list-style-type: none"> • Writing questions in the margin • Writing a list of wonderings • Writing a note to a peer • Writing a note to the teacher
Communicating to tell your point of view	<ul style="list-style-type: none"> • Stating a position on a question • Making oral predictions • Telling the group about something you noticed • Telling if you think the problem is hard or easy • Explaining how you interpreted the problem • Suggesting a strategy or approach to the group • Explaining your assumption 	<ul style="list-style-type: none"> • Writing an answer to a poll or opinion question • Writing the answer to a prediction • Writing down something you noticed about the problem • Writing about whether a problem seems hard or easy to you • Writing about your interpretation of a problem • Writing about how you plan to approach a problem • Writing about assumptions you made
Communicating to tell what happened	<ul style="list-style-type: none"> • Telling the teacher about your "aha!" moment • Explaining to a peer what steps you did to get the answer • Explaining to the class what steps you did to get the answer 	<ul style="list-style-type: none"> • Writing about your "aha!" moment • Writing down the steps you did • Writing a guide to show someone else the steps to take
Communicating to explain	<ul style="list-style-type: none"> • Telling a peer how you thought about the problem • Showing a peer how you solved the problem and telling how you knew • Telling the class or the teacher what steps you did and how you thought to do them 	<ul style="list-style-type: none"> • Writing a personal account of how you thought to solve the problem • Writing about how your steps connected to your understanding • Writing a guide to help someone who is stuck think through the problem
Communicating to justify	<ul style="list-style-type: none"> • Telling why you are confident in your answer • Debating with another student about which answer is correct • Giving a counterexample to someone else's argument • Explaining why there can only be one answer to the problem (or why there are definitely multiple answers) • Using definitions to show that your reasoning is right • Proving that your answer must follow from the definitions/assumptions 	<ul style="list-style-type: none"> • Writing about how confident you are • Writing an argument for why you are correct • Writing a counterexample to disprove an argument • Writing an explanation of why there can only be one answer to a problem (or why there are definitely multiple answers) • Using definitions to write a justification of your answer • Writing a two-column proof • Writing a paragraph proof • Writing an article for a mathematical journal

Student Solutions to Wooden Legs

Lauren

Answer:

There are only 3 ways she can use all 31 legs.

Explanation:

I know this because I used blocks and these are all of the solutions I got: 9 stools and 1 table, 5 stools and 4 tables, and lastly 1 stool and 7 tables.

Wyatt

Answer:

1. 7 tables and 1 stool 2. 9 stools and 1 table 3. 4 tables 5 stools

Explanation:

guess and check but only the numbers before 10 or it will be 40 and 30.

Michaela

Answer:

in the and my group found three answer: the first answer was 7 table and 1 stool the second we answered 9 stools and 1 table and third one was 4 tables and 5 stools.

Explanation:

$$7*4=28 \text{ and } 1*3=3 \text{ } 28+3=31$$

$$4*4=16 \text{ and } 3*5=15 \text{ } 16+15=31$$

$$9*3=27 \text{ and } 4*1=4 \text{ } 27+4=31$$

Shalina

Answer:

She can make 1 of the 3-legged stools and 7 of the 4-legged table, 5 3-legged and 4 4-legged, and 9 3-legged and 1 4-legged.

Explanation:

I first went $1*4=4$ then $31-4=27$ which if divided by 3 becomes 9 so that would make it 1 4-legged and 9 3-legged. Then I did the same thing with 3 so i went $1*3=3$ then $31-3=28$ which divided goes in evenly with $4=7$ so 1 3-legged and 7 4-legged. Then it goes to the 2's and $2*3=6$ then $31-6=25$ which does not go in evenly with 4 so it cant be one of the answers . Then I kept on going on untill I couldn't go on any more.

Misha

Answer:

There are three combinations in order to use all 31 legs: 1 table and 9 stools; 4 tables and 5 stools; 7 tables and 1 stool.

Explanation:

1 table x4 legs =4 legs. 31 legs-4 legs=27 legs. 27 legs:3=9 stools.

2 tables x4 legs=8 legs. 31 legs-8 legs=23 legs. 23 can't be divided by 3.

3 tables x4 legs=12 legs. 31 legs-12 legs=19 legs. 19 can't be divided by 3.

4 table x4 legs =16 legs. 31 legs-16 legs=15 legs.15 legs:3=5 stools.

5 tables x4 legs=20 legs. 31 legs-20 legs = 11 legs. 11 can't be divided by 3.

6 tables x4 legs=24 legs. 31 legs-24 legs = 7 legs. 7 can't be divided by 3.

7 tables x4 legs =28 legs. 31 legs-28 legs=3 legs. 3 legs:3=1 stool.

Jake

Answer:

You can build seven table and one stool.

Explanation:

I just divide 4 into 31 and i got 7 remainder three seven times four = 28 and the remainder is for the one stool (3)

Conner

Answer:

One combination is 1 stool and 7 tables, another is 9 stools and 1 table, and the last one is 5 stools and 4 tables.

Explanation:

First I was trying to think of combinations in my head but then I thought of creating a list of numbers that equal 31. On the left side from top to bottom I did 0-15 and on the other side I did 31-16. Then I found that 3 was a multiple of 3 and 28 was a mutiple of 4 so that meant 1 stool and 7 tables. So that was my first combination. Then I found that 4 was a multiple of 4 and 27 was a multiple of 3 so that meant 9 stools and 1 table. My third combination was 15 legs and 16 legs which meant 5 stools and 4 tables.

Kelly

Answer:

Wendy can make 10 stools but she will have 1 leg left over.

Explanation:

The process I used was I first counted by 3 until I got to 30 but I had 1 left over so I wrote it down.

Noah

Answer:

Wendy can make 1 table and 9 stools, she can make 7 tables and 1 stool and she can make 4 tables and 5 stools.

Explanation:

First, if Wendy uses 1 table that is 4 legs. $31 - 4 = 27$ and 27 divided by 3 equals nine so 1 table and 9 stools uses all 31 legs. Second, Wendy uses 7 tables and 1 stool because 7 times 4 equals 28 + 3 for the 1 stool. Last, Wendy could do 4 tables and 5 stools because 4 times 4 equals 16 and 5 times 3 equals 15. 15 plus 16 equals 31.

Julia

Answer:

There are 3 possible ways to make furniture.

Explanation:

The first possible way to make 3-legged stools and 4-legged tables is to make 5 stools and 4 tables. My second way was 9 stools and 1 table. My last way was to 1 stool and 7 tables. I got my answers by using 3 strategies. My first strategy was to make a table. I took a ruler and made 3 columns. In the first column I wrote 3-legged stools. Then, in the second column I wrote 4-legged stools. In the last column wrote total legs. My second strategy was guess and check. This tied in with my table. I would think for a while and then write my guess down. Then, I did the math and totaled the legs. My last strategy was very unusual. I made a blank line and on the side wrote stools. I did the same with tables. Then, next to tables/stools I wrote equals blank legs (= ___ legs). I found these strategies very helpful.

$$\begin{array}{r} 5 \text{ stools} = 15 \text{ legs} \\ + 4 \text{ tables} = 16 \text{ legs} \\ \hline 9 \text{ furniture} = 31 \text{ legs} \end{array} \qquad \begin{array}{r} 9 \text{ stools} = 27 \text{ legs} \\ + 1 \text{ table} = 4 \text{ legs} \\ \hline 10 \text{ furniture} = 31 \text{ legs} \end{array}$$

$$\begin{array}{r} 1 \text{ stool} = 3 \text{ legs} \\ + 7 \text{ tables} = 28 \text{ legs} \\ \hline 8 \text{ furniture} = 31 \text{ legs} \end{array} \qquad \begin{array}{r} 3 \text{ stools} = 9 \text{ legs} \\ + 7 \text{ tables} = 28 \text{ legs} \\ \hline \text{furniture} \quad \text{legs} \end{array}$$