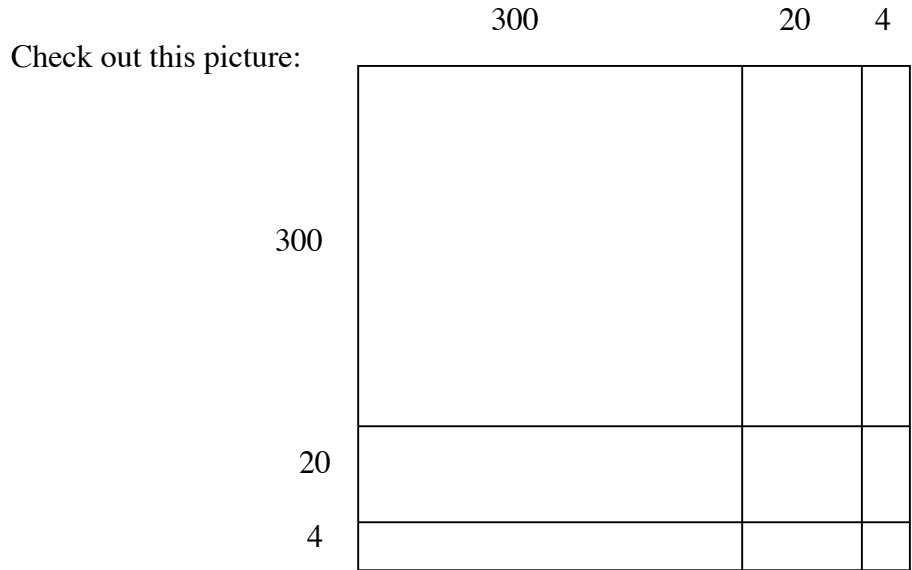


Worksheet Number Nine

Here is how the ancient Chinese conceptualized the approximation of square roots. Look at the number 324, for instance. If $N = 324^2$ then $N = (3 \cdot 100 + 2 \cdot 10 + 4)^2$ and we can see that $N = 104976$. Now, how could you get at 324, if all you knew was that $104976 = N^2$?



Now divide 104, 976 into two-digit pairs, since digits become no more than two-digit numbers when you square them. $6 \times 6 = 36$, etc. So you are looking at 10 49 76.

What 100's will square and be less than or equal to 10 00 00 ? 300.

Organize it like a long division:

10 49 76	□ 3 2	
9	□	This is the 300 squared, the 90,000
□	□	
This is 2X3	□	62
1	49	(really 2X300 + 20)
1	24	Do you see 20(2X300 + 20) in
□	□	the picture?
This is 2(300 + 20)	□	644
25	76	(Do you see 4(2(300 + 20) + 4) ?
25	76	
0 remainder		

