

Letterboxes: You Could Be a Winner!

The purpose of this Exploration is to review some of the important functions found in Chapter 1, while perhaps providing some surprises along the way. The object of the game is to fill in all the squares. (If you feel up to a little extra challenge, try doing it without a calculator.)

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X

1. Pick a whole number between (but not including) 2 and 9. Write it in Box A.
2. Multiply the number in Box A by 9 and write the second digit of the result in Box B.
3. Add the number in Box A to the number in Box B and write the sum in Box C.
4. Write your age in Box D.
5. Take the common logarithm of the number in Box C and write it in Box E.
6. Using the number in Box A as slope and the number in Box E as y -intercept, write an equation of a line in Box F.
7. Find the x -intercept of the line in Box F and write it in Box G.

8. Using the number in Box G as slope and the number in Box D as y -intercept, write the equation of a line in Box H.
9. Evaluate the function in Box H at the number in Box A. Subtract the result from the number in Box D and write the difference in Box I.

10. Find the absolute value of the number in Box G and write it in Box J.

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11. Divide the natural logarithm of the number in Box J by the natural logarithm of the number in Box A, and write the result in Box K.

12. Find the letter of the box that contains the largest number in the grid so far. Think of a European country beginning with that letter and write it in Box L.

13. Take the second letter of the country in Box L. Think of a one-digit number beginning with that letter and write that number in Box M.

14. Find the sine and the cosine of the number in Box M. Square these two numbers and write the sum of the squares in Box N.

15. Write the number in Box C as a word. Change a single letter of the word to get the name of a trig function. Write that function in Box O.

16. Find the period of the function in Box O and write it in Box P.

17. Multiply the number in Box A by the number in Box P. Plug the product into the function in Box O and write the function value in Box Q.

18. Find the product of all the numbers in the grid so far and write that product in Box R.

19. Raise the number in Box A to the power of the number in Box R. Write the result in Box S.

20. Add the number in Box M to the number in Box S and multiply the sum by the number in Box D. Write this product in Box T.

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21. Add the digits of the number in Box T together. If the result is a single digit, write it in Box U. If the result is two digits, add those two digits together and write the sum in Box U.

22. There is one number that appears in every row of the grid. The letters that correspond to the boxes containing that number can be rearranged to spell a function. Write that function in Box V.

23. Find the number in the grid that rhymes with the function in Box V. Write the letter of the Box containing that number in Box W.

24. Find the angle of intersection (in radians) of the two lines in Boxes F and H. Evaluate the function in Box V at that angle and write the function value in Box X.

If you have successfully filled in all the letterboxes, read the contents of the last two aloud and hear our special message to you!