

# Playing With Primes

	1		2	3	4		5		6
			7		8		9		
10									
					11	12		13	
14		15							
16					17				18
								19	
				20			21		
22	23		24				25		26
27					28	29			
		30		31				32	
		33				34			

All across and down “words” are prime numbers. In addition, the numbers must satisfy the clues listed below:

## Across:

- |  |   |
|--|---|
| 1 Last digit is one less than twice the sum of the other digits                  | 20 Second digit is sum of the last three digits                                     |
| 7 Middle digit is one more than the sum of the other digits                      | 22 20 across with second digit decremented by one and last digit incremented by two |
| 9 Last two digits are the same   | 25 Reverse last two digits of 4 down, multiply 18 down, then add five               |
| 10 First two digits are 20 down minus three; last two digits are the same        | 27 Same as 31 down  |
| 11 Last digit is sum of first and third digits                                   | 28 Last three digits of 6 down  |
| 14 First 6 digits are in descending consecutive order                            | 30 Second digit is sum of first and third digits                                    |
| 16 First and third digits are the same   | 33 First digit is second digit divided by last digit                                |
| 17 The product of the first two digits equals the product of the last two digits | 34 Last digit is sum of the others  |
| 19 Sum of digits of 30 across plus sum of digits of 2 down                       |   |

**Down:**

- 1 First and fourth digits are the same; second and third digits are the same; last two digits are same as the last two digits of 29 down.
- 2 Third digit is sum of fourth and fifth digits
- 3 19 across reversed
- 4 First three digits are same as first three digits of 2 down
- 5 First two digits are reversed 26 down; third digit is sum of last three digits
- 6 Last digit is one more than the sum of the other digits
- 12 First two digits are 28 down; last three digits are 29 down plus ten
- 13 First and fourth digits are the same; second and last digits are the same
- 14 First seven digits are in descending consecutive order
- 15 Second digit is sum of the last two digits
- 18 Sum of the digits of 15 down
- 20 Reverse of four more than 18 down
- 21 Third digit is fourth digit minus fifth digit
- 23 18 down plus thirty
- 24 First two digits are three times first two digits of 1 across
- 26 First two digits of 5 down, reversed
- 28 Sum of the digits of 1 across
- 29 7 across plus ten
- 30 Two more than 31 down
- 31 Last two digits of 4 down
- 32 Last two digits of 6 down, reversed

**Bonus Question:**

The answer for 14 across has a unique property. What is it?

Solution is on next page

## Solution

	1	0	1	1	1	0	7		2
	0		3	7	3		9	1	1
5	0	9	9		9		8		3
	1		3		2	1	5	7	7
9	8	7	6	5	4	1	0	3	
8	3	8	9		1	3	3	1	3
7		8				9		7	1
6		5		5	7	3	3	1	
5	6	3	3	3			4	3	9
4	1		0		1	3	7		7
3		4	8	4	1	8	8	7	
1		3	3	1		3	1	3	7

### Bonus Question:

It is the largest prime number in base ten with no repeated digits.