Name _____

Why Did the Horse Eat With Its Mouth Open?

Write the prime factorization for each number. Find your answer in the adjacent answer list. Write the letter of the answer in each box containing the number of the exercise.

(1) 12	(2) 20	(3) 35
(4) 36	(5) 75	(6) 99
(7) 60	(8) 56	(9) 26
(10) 81	(11) 100	(12) 90

(U) $2 \times 3 \times 5$
(B) $2^2 \times 3$
(E) 5×7
(G) $2^2 \times 7$
(H) $2^2 \times 5$
(D) 3×5^2
(J) 2×3^2
(M) $3^2 \times 11$
(R) $2^2 \times 3^2$
(F) $2 \times 5 \times 11$
(K) 23×5
(I) 2×13
(C) $2 \times 5 \times 7$
(L) $2^3 \times 7$
(S) $2^2 \times 3 \times 5$
(A) $2^2 \times 5^2$
(O) 2×3^3
(N) 3^4
(T) $2 \times 3^2 \times 5$
(P) $2^3 \times 3 \times 5$

9	12	2	11	5	1	11	5	7	12	11	1	8	3	6	11	10	10	3	4	7

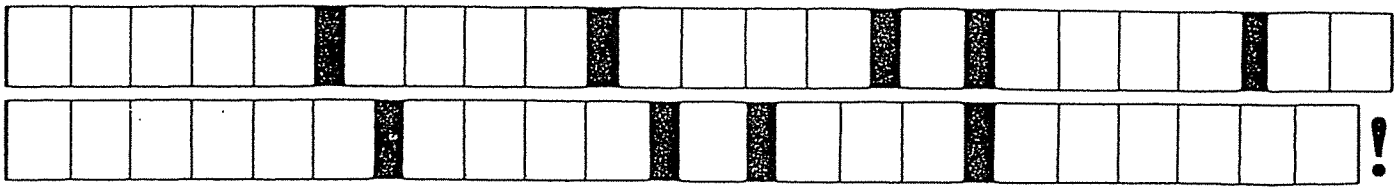
Some Friendly Advice

SOME "FRIENDLY ADVICE" IS HIDDEN IN THE RECTANGLE. TO FIND IT:

Circle letters next to each given number to show divisibility by 2, 3, 5, 9, or 10. Write the circled letters on the line at the right. Also write the letters, in order, into the boxes at the bottom of the page. *HINT: Two of the given numbers are not divisible by 2, 3, 5, 9, or 10; no letters will be circled for these numbers.*

	Number	Divisible by				
		2	3	5	9	10
1.	4,095	S	N	E	V	O
2.	8,170	E	D	R	L	J
3.	2,685	O	U	M	G	S
4.	534	P	I	A	T	F
5.	609	S	N	F	X	T
6.	29,178	T	O	T	A	I
7.	90,005	O	A	P	E	B
8.	467	N	E	M	I	C
9.	60,201	R	I	E	L	T
10.	3,375	S	E	O	F	N
11.	76,380	L	E	A	D	V
12.	599,422	E	V	M	S	G
13.	853,806	S	W	I	F	A
14.	492,570	I	T	H	A	W
15.	12,685	I	A	E	P	B
16.	64,423	E	D	A	L	M
17.	9,999	K	T	B	S	T
18.	501,105	R	U	C	H	D
19.	800	K	M	E	N	R

Friendly Advice:



Factors

This problem gives you the chance to:
- work with factors of numbers up to 30

A factor of a number divides into the number exactly.

This table shows all the factors of most of the numbers up to 30.

Number	Factors	Number of factors
1	1	1
2	1, 2	2
3	1, 3	2
4	1, 2, 4	3
5	1, 5	2
6	1, 2, 3, 6	4
7	1, 7	2
8	1, 2, 4, 8	4
9	1, 3, 9	3
10	1, 2, 5, 10	4
11	1, 11	2
12	1, 2, 3, 4, 6, 12	6
13	1, 13	2
14	1, 2, 7, 14	4
15	1, 3, 5, 15	4

Number	Factors	Number of factors
16	1, 2, 4, 8, 16	5
17	1, 17	2
18	1, 2, 3, 6, 9, 18	6
19	1, 19	2
20	1, 2, 4, 5, 10, 20	6
21	1, 3, 7, 21	4
22	1, 2, 11, 22	4
23	1, 23	2
24	1, 2, 3, 4, 6, 8, 12, 24	8
25	1, 5, 25	3
26	1, 2, 13, 26	4
27	___ ___ ___ ___	4
28	___ ___ ___ ___ ___ ___	6
29	___ ___	2
30	1, 2, 3, 5, 6, 10, 15, 30	8

1. Write the factors of the numbers 27, 28, and 29 in the table.

2. The numbers 1 and 4 have an odd number of factors.

   a. Write down all the numbers up to 30 that have an odd number of factors.

   1, 4, _____, _____, _____

   b. Complete this sentence:

   All the _____ *numbers up to 30 have an odd number of factors.*

3. The number 10 has two odd factors (1 and 5).
   It also has two even factors (2 and 10).

   The number 18 has three odd factors (1, 3 and 9).
   It also has three even factors (2, 6 and 10).

   a. Write down all the numbers up to 30 that have an equal number of odd and even factors.

   2, 6, 10, _____, 18, _____, _____, _____

   b. Describe two patterns you can see in the above sequence of numbers.

_____

_____

_____

_____