EQUATIONS WORKSHEET

7Z

NAME _____

FACTORIAL – IV (JS only)

PRINCIPLE

The **factorial** variation works in combination with other variations.

Factorial in Combination with Other Variations

(a) # factors x(5!) = x120 = x(2^3 x 3^1 x 5^1) = 4 x 2 x 2 = 16.

(b) Small. prime x(6!) is not allowed since 6! is bigger than 200. However x(5!) = x120 = 127.

(c) Red exp. A Goal of 23 (red 3) may be interpreted as $2^{3!}$ or 2^6. In a Solution write $2^{(3!)}$ to prevent an opponent from interpreting the expression as (2^3)!

(d) 0 or x wild 0 or x may not stand for ! because ! is not a symbol on the cubes.

(e) Sr: √ = *i* √3! must be written √(3!) or 3!√ to prevent an opponent from interpreting it as (√3)!, which is undefined.

EXERCISES

Give each possible value of each expression. Assume factorial is in effect along with the variation listed.

1.	sideways	(6 x ↷)!	_____	**2.**	upside-down	(4 – ?)!	_____
3.	# factors	x3!	_____	**4.**	# factors	x(4!)	_____
5.	smallest prime	x(4!)	_____	**6.**	smallest prime	x3!	_____
7.	red exponent	$3^{3!}$	_____	**8.**	average	3! + (5!)	_____
9.	base 8	12! ÷ (10!)	_____	**10.**	base 9	11! ÷ [(5 + 4)!]	_____
11.	base 11	(21 – 1x)!	_____	**12.**	base 12	√! – (x!)	_____
13.	Sr: √ = *i*	5!√	_____	**14.**	Sr: log	(8 ·l· 2)!	_____

15. Complete this table. x represents **number of factors**.

n	*n*!	x(*n*!)	*n*	*n*!	x(*n*!)
0	1	1	5		
1	1	1	6		
2	2	2	7		
3	6	4	8		
4			9		

16. If x represents **smallest prime**, what is the smallest value of *n* for which x(n!) is illegal? __

Simplify each expression.

Sample √(6!) = √(6 x 5 x 4 x 3 x 2) = √[(6 x 3 x 2) x 4 x 5] = 6 x 2 x √5 = 12 x √5
(6 x 3 x 2: perfect squares; 12 x √5: Goal to set)

17. √ (5!) _____ **18.** √ (7!) _____

19. √ (8!) _____ **20.** √ (9!) _____

MORE CHALLENGING EXERCISES

*With **factorial** and **mult. op.**, use all the Resources listed to write a Solution for each Goal.*

	Goal	Resources	Solution		Goal	Resources	Solution
21.	80 x 54	6 7 –	_____	**22.**	1 ÷ 10	6 7 9 ÷ x	_____
23.	24 x 34	4 5 6 – +	_____	**24.**	66	4 5 7 + ÷	_____